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THOS. F. RUMBOLD, M. D.,
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ASSOCIATE EDITOR.

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All communications, letters, remittances, books for review, etc., should be directed to THOS. F. RUMBOLD, M. D., 1225 Washington Avenue, St. Louis.

Foreign exchanges and books for review should be sent under cover to Messrs. Williams & Norgate, 14 Henrietta Street, Convent Garden, London; or to Herr B. Hermann, Leipzig; or M. Charles Reinwald, 15 Rue des Sts. Peres, Paris.

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THE

SAINT LOUIS

MEDICAL AND SURGICAL

Journal.

VOL. XXXIV.——FEBRUARY, 1878.——No. 2.

Original Contributions.

ARTICLE XIV.

GENESIS.—II.

By HIRAM CHRISTOPHER, M. D., of St. Louis.

I am not unmindful of the fact that we should be modest and cautious when speaking of the possibilities or impossibilities of science. It has accomplished such wonders, and achieved so much that was apparently impossible in these late years, that some men are disposed to believe that it is well-nigh omnipotent —that nothing is impossible to it. Nevertheless, we may still hazard the belief that some things are indeed impossible to it, and will ever be. We may certainly venture to deny it *creative* power. It cannot show us that something can be generated from nothing, and thereby convince us that phenomena have not an efficient and adequate cause. Its field is the actual, not the possible. Reason may consider the latter, but science must deal with facts. These it may investigate and classify; but it cannot predict the possible only as this may be seen, or conjectured as dependent on what is actually observed and known.

All claims of science should be based on fact or reason. They should be rational. Anything unreasonable or absurd, as our

reason may esteem it, unless a fact, should be regarded as unscientific. Men may, and have claimed, in the name of science, what was unreasonable—what was not warranted by facts, but science was not pledged by the claim. Science follows facts, and is guided by reason, and hence is guilty of no absurdity whatever. Though a few men have affirmed that psychical phenomena have the same basis and origin as the physical, and say that the conclusion is sustained by facts; that the latest achievements of science point in this direction, and to this conclusion; yet we know from the denial of others, equally competent and scientific, that the statement has no scientific force; that it is but the doctrine of those who seem to wish to see phenomena is this light. The best that can be said for such a claim is that it is an *inference*, and not a necessary one either. That mind was latent in "the cosmic vapor" may be an inference apparently required by numerous facts; but it cannot be proved. It can never be more than an inference, and not a rational one either. Its proof is simply impossible.

It is not much encouragement to the acceptance of such an hypothesis to know that it rests on the assumption that matter and its forces are eternal, an assumption made from necessity and for the occasion. The hypothesis also assumes the identity of the vital with the physical force. This school holds and teaches that there is no categorical or specific difference between the vital and physical force, and none between psychical and physical phenomena. They believe that mind was once latent in "the fiery mist," in which form matter once appeared; and that it is possible to predict, from a knowledge of matter and its forces, the ultimate outcome of molecular action; that "from a knowledge of the properties of the molecules of that cosmic vapor, a sufficient intelligence could have predicted, say the state of the fauna of Brittain in 1869, *with as much certainty as* any one can say what will happen to the vapor of the breath in a cold winter day." Now, as the fauna of Brittain contained, in 1869, many species which displayed very high psychical faculties and phenomena, Mr. Huxley would have us believe that these faculties and phenomena result entirely and exclusively from the molecular arrangement the molecules of the cosmic vapor came finally to assume, under the operation of a force that is inherent in them —the relation in which they are found in animals possessing psychical faculties, and exhibiting psychical phenomena. It

might be thought immodest to characterize such a notion as absurd and visionary in the extreme; but it would be none the less so, if a thousand Huxleys were to affirm it. If the hypothesis were true, we ought to find one unbroken series of phenomena, stretching from the beginning to the present, each member resting on, or proceeding from, its immediate predecessor, in such a way, and to such an extent, that the latter was always evolved from the former. If such an unbroken series does not exist, and has not existed, and cannot be shown to have existed, then the hypothesis is without foundation in fact or reason. Of this assumption Agassiz says: "The supposition that all animals constitute one continuous, graduated series can be shown to be contrary to nature; that in proportion as our knowledge of the true affinities of animals is improving, we accumulate more and more convincing evidence *against* the idea that the animal kingdom constitutes one simple series." That we should follow Agassiz and not Huxley, as the true exponent of the facts of nature involved in this question, will appear evident as we proceed.

What is matter to which so great a power is attributed by the cosmic vapor school of scientists? It is much easier to ask the question than to answer it. What *it is* we need not care to know. We know that much is visible and tangible, and that all is possessed of certain properties. Some material substances are invisible; but we are satisfied of their existence by the phenomena they present. Such are some of the elementary gases. We know them, and distinguish them by their properties, and by these are just as fully assured of their existence as though they were visible and tangible. Matter is not a unit, except as an abstract conception. It is multiform, and of many kinds, and its elements inconvertible the one into another. Lead is not copper nor is iron gold, nor can the one be transmuted into the other. They may not all have been *created* at the same time, unless such was the pleasure of the *creator*. But if matter had no creator—if it is, in fact, eternal as to its existence, then all material substances are equally eternal. We would have, in that event, as many eternal entities as we have simple elements; and if all things now existing owe their being to matter as their potential cause, we have as many creators as elements, and, consequently, as many Gods. Thus would these cosmic vapor scientists give us many gods for the one *Great God* they would deprive us of! When we ask them for a fish, they give us a stone!

But confessedly matter can do nothing without its forces. There could be no iron, or phosphorus, or any other purely material substance in our bodies if it were not for the force of chemical affinity. There could be no material compounds in nature, but for this force. Are the physical forces inherent in matter, or distinct and separable from matter? If the latter, then we must add to the number of the material deities! But it matters not, so far as the question under consideration is concerned, whether they are inherent or distinct. We know that matter is utterly impotent without them. The imponderable agents are really the active forces concerned in the production of physical phenomena. Without these the elementary substances would have continued forever in their simple state. There could have been no combination one with another. The power, then, which these scientists ascribe to matter, should be really ascribed to the forces of the physical world. These are only material because connected with matter. Chemical affinity, heat, light, etc., have none of the common properties of matter. We know they exist. Some we can see and feel, and others we know from their phenomena. This evidence of their entity or existence, is satisfactory, and, indeed, unquestioned. The school of modern scientists admits all this. The admission will be found useful to the cause of true science, and hurtful to the false. These forces are subtle; yet we know that they exist. They may be entities, and not mere habits or phenomena of matter. They are, at least, constant, if not inherent. They are not a form of matter, for they have none of its properties. Their existence, therefore, suggests the possibility of the existence of other subtle agents or powers which are still farther removed from the substantial nature of matter, and afford us standing ground for believing in another force, even more subtle than physical forces. The vital force may be such a different force. Its phenomena are different, if not differential. Chemical affinity may give rise to heat, or light, or electricity, and we might admit its convertibility into these, under certain conditions or circumstances; but neither of these are transmuted into the vital, nor the vital into either of them. This will appear evident further along, when we find the vital force associated with *will* power.

There is, confessedly, no spontaneity in matter or its forces. They are all wholly passive. They remain at absolute rest or equilibrium, unless acted on by a force from without. How,

then, can they give origin to anything? Their inertia makes this impossible. The movement of the atoms of matter is produced by a power really external or foreign to them. All the changes that they undergo, take place under the influence and action of their forces; and all the changes that they are capable of effecting, are the measure of the power of physical forces. Under the same conditions the action of physical agents is always the same. The same effects are always produced by the same causes. Chemical affinity will form of iron and other substances numerous combinations; but always the same body with the same substances in the same quantity and under the same conditions. What physical forces can effect will be effected, and that readily and invariably when the necessary conditions are present. What is beyond their power must be ascribed to a supernatural power. Of this there cannot be the slightest doubt.

What, then, is the limit of the power and action of physical forces? If there be a phenomenon which they cannot produce, the existence of that phenomenon must be ascribed to a power specifically different from any and all physical agents. The changes effected in material substances by physical agents are indeed, wonderful; but however great, the formed bodies never lose their material properties. We can readily tell that they are still purely material substances, though the change is from the solid to the gaseous state. There are, indeed, no traces of iron in its sulphate, nor of zinc in its chloride. The salts present no trace of the elements that compose them. The same is true as regards crystals. The crystal of an element is wholly unlike that of its salts. These are great and wonderful changes which physical forces work with the elements of matter; but they are so common and easily produced, that they excite no surprise in those who know anything of the causes and properties of the substances, which effect the changes. Crystals, acids, bases, salts, and neutral bodies are really the limits of the changes in matter which physical forces can effect. In the inorganic world their work is always on the same plane; but chemical changes in organic bodies are, with but a few exceptions, in a downward direction—from the organic to the inorganic; never in an upward direction, on the plane of the living organism or its products. On the other hand, it is universally admitted that all the work of the vital force is in an upward direction. It forms living organisms out of dead matter. It imparts motion to that which is at rest

and cannot move of itself. In the organisms which it forms, it gives rise to phenomena which are unknown and impossible to the most complex bodies of the inorganic world. Its work has placed an impassable gulf between the organic and inorganic kingdoms of nature. No work of physical agents is found within its field, and none of it in that of physical forces. These facts cannot be explained on any hypothesis that does not recognize the specific nature of the vital agent. Their nature and phenomena are the poles apart.

It is to the vital force, as the cause, that living organisms are ascribed even by the modern scientist. The error of this school lies in its misconception of the *nature* and *realm* of this force; in denying to it an existence that is *pro*natural, and a nature that is *super*natural, and a mode of operation that is specifically different from that of any other force or agent known to science. If it has no specific power over the elements and atoms of matter, different from that of chemical affinity, it ought to be as much under the control of the chemist as is chemical affinity, or other physical forces. There are but few combinations of matter found in the inorganic world, which the chemist cannot effect or reproduce. He can also crystalize many simple and compound substances, destroy them, and then reform them. The crystal can be destroyed by heat, and the salt by decomposing agents; but the chemist can again place the metal under proper conditions for crystalizing, and reproduce the salt by removing the decomposing agents. These are familiar phenomena, and hence excite no surprise. But if he were to revive the dead organism, and set all its organs in motion again, our surprise would be so great that we might cry out, "The gods have come down to us in the likeness of men." If the vital agent were but a physical force men ought to do this. But they can neither revive a dead organism nor make a living one. They cannot even make "formed matter," which is non-living organic matter. And why not, if the living organism is only an advance on the crystal, as the crystal is an advance on the same substance in an amorphous form? If this were really a fact, then the production of living organisms should not only be possible, but as common in the chemist's laboratory as are crystals and salts. But the fact that living organisms are impossible to any agency which men may employ, is proof that the life agent is not a physical force, nor under the control of the scientist in any degree. Every force or agency under the con-

trol of man has been put to the utmost test in the hope that living organisms may come into being through its operation. But there has been no response but the silence of death. Spontaneous generation is still a dream. The atoms of matter will not assume a vital relation except under the power of the life agent. The dream of spontaneous generation is the dream of an abnormal mind or heart.

When we bring an acid and a base together under proper conditions, we find that they readily combine, and form a body very much unlike either. If we bring the chloride of barium and the sulphate of soda together in sólution, a complex change of atoms takes place. How they are arranged in the new salts we cannot tell. Whatever may be the complexity of atomic combination in the most complex salts, we know that the result is only a material salt—that there is no organism in this complexity. If the atomic combination of the most complex salt, were a thousand times more complex than it is, the result would be only a material salt. In such changes and combinations the atoms of matter make these changes and form these combinations under the influence of chemical affinity. They are determined by the chemical force. Their motion in assuming new relations is not spontaneous. They have no will, and hence no spontaneity. Nor is the action of the chemical force spontaneous. It must act when substances, having affinity for each other, are brought together under proper conditions. The positive and negative poles of a battery are not more attracted. As positive electricity attracts the negative, so do substances by virtue of their chemical affinity. The one cannot resist the other, so as to resist the union. Their union is a necessity, not a spontaneity. Hence, all that the chemist can do in the work of chemical combinations, is to place substances, having an affinity for each other, under the proper and and necessary conditions. He cannot determine the relations the atoms shall assume in the new combinations; and chemical affinity does this, whatever this may be. The union of atoms can be prevented only by destroying the proper and necessary conditions. Hence, if we expose iron to moist air, an oxide will be formed; if zinc to dilute sulphuric acid, a sulphate will be formed, and not something else. This result cannot be prevented, except in the way stated. But if we bring together carbonic acid and water in every way possible to the chemist, he cannot make them unite so as to form any one of

the ternary compounds—either sugar, gum, starch or cellulose. Much less can he hope to create living matter, or a living organism in which alone these ternary bodies are formed.

The production of compounds, of the series of organic bodies just bordering on the confines of the inorganic world, has been accomplished by the direct method, but they belong to that series of organic bodies which are produced by the decomposition of ternary or quarternary compounds. But higher than this the chemist has not gone. The experiments that have been made in the interests of spontaneous generation, have all been made with organic matter; and even under this favorable circumstance or condition—an advantage to which the investigator was not entitled—success has failed to crown the most patient, persistent, and protracted efforts. Spontaneous generation is yet an impossibility, and will ever prove to be so. Prof. Tyndall says that spontaneous generation is yet unrealized. "Is there no experimental proof of spontaneous generation? I answer without hesitation—none." The fact is that the wish is father to the hope, and the inspiration of all efforts in this direction. Fact and reason are against any such a hope or expectation. The utter impossibility could have been inferred had the reasoning and procedure been scientific. The method of inquiry that ignores, disregards, or excludes certain phenomena, as common and as familiar as the formation of salts, cannot be regarded as rational and scientific. Had the pursuers of this *ignis fatuus* began with man and gone back to the microscopic organisms, instead of beginning with the latter and going toward the former, they would have discovered, before experimenting, that it is impossible to assign the psychical phenomena of man or of the lower animals to a purely physical origin or base. They would have seen in the development, and gradually increasing manifestation, of the power that imparted spontaneity of motion, and the power of growth and reproduction to living matter or the living organism, as this development and psychical manifestation appears in man, the true nature of the life-giving power. In him psychical phenomena are displayed in such a degree and of such a character as to point to their true nature, origin and basis. One would have supposed that the greatness and sweep of man's psychical powers would at once have forbidden all hope of success of any effort made to prove a physical basis for vital phenomena. Nevertheless, some scientists, even after repeated failures, still declare their belief

that mind has no basis different from that of salts and crystals; that it is but a function of organized matter, as the medical properties of a salt are of it. Yet these scientists smile at the simplicity and credulity of the man who dreams of a perpetual motion—a dream no more irrational nor impossible than spontaneous generation, and no more absurd than that mind is really a physical phenomenon. Men who have struggled with the problem of spontaneous generation, look with compassion on the dreaming enthusiast, whilst they themselves are laboring on as wild a dream. They tell the misguided man that his dream is impossible, and his labors a waste of time and energy. Yet the hope of the former is just as rational as that of the latter; and I am at a loss to understand why the scientist is to be regarded as rational in his pursuit, while the dreamer of a perpetual motion is to be put down as a simpleton. The scientist has no advantage; for to believe that mind of every degree, and genius of every kind, were potential or latent in the forces of "cosmic vapor," or "the fires of the sun," is unreason just on the borders of insanity.

Article XV.

On the Treatment of Certain Fractures, with Introductory Remarks. By W. R. Whitehead, M. D.,* of Denver, Col.

The object of this paper is to offer a few remarks on the treatment of certain common fractures, more with a view to elicit an instructive discussion, than to call your attention specially to views which I may entertain regarding the right management of such cases. It is unnecessary to remind you of the want of apparent interest that has generally been taken in our Society by its members, and how infrequent have been the discussions on subjects in surgery, and indeed, on those in medicine, which to us are of daily practical importance. I believe the same reproach will apply to many other medical societies, but, I appre-

* Read before the Denver Medical Association.

hend, to none more aptly than to ours; because among its members is to be found more than an average proportion of those who by their attainments and practical knowledge are qualified and abundantly able, if they will, to raise our society to a high position in the estimation of the medical profession, and of the public, so that to be a member of the Denver Medical Association, would not only be evidence of professional standing and ability, but to the public a conspicuous distinction between the physicians of our city and the very numerous irregular practitioners who infest this State. You know, gentlemen, that the local and State Medical Societies, in conjunction with the American Medical Association, form the really distinctive effective means for guarding and fostering medical science in this country; and that some of the medical colleges are disposed to lower rather than elevate the standing of medical instruction.

Let us then do our duty to our profession and to humanity by endeavoring to revive an active interest in our Society, and make it worthy of the great profession which we represent by a more earnest and well directed study and discussion of practical subjects in medicine and surgery. And let us try by a cordial reciprocity of feeling and a commendable emulation to inspire that respect for medical science that will eventually lead to intelligent legislative enactments, and to a proper regulation of the practice of medicine in our new State, for the suppression, or at least the abatement of quackery. This is the view I entertain regarding the proper duty of our little Medical Society, numbering at present about a dozen or fifteen members only, but destined by our efforts, if we do our duty, to aid largely in the elevation of the standard of the medical profession in Colorado.

Fracture of the Clavicle.—The clavicle is properly a bone of the upper extremity, and in connection with the treatment of fractures of this bone, I have the following to offer: That in a retentive apparatus for this fracture, in addition to other obvious indications, it is of paramount importance to fix both the scapula and humerus to obtain a minimum of deformity. Malgaigne* observes that if it is thought to be of great importance to obtain an exact consolidation of the fragments, in his opinion the surest means to accomplish this object is to subject the patient to the dorsal decubitus for three weeks, with the elbow fixed to the

*Traite des Fractures, etc., vol. i., p. 490, Paris, 1847.

side, or in front of the chest; the arm of the well side also fixed, the hand immovable upon a pillow, and finally the hand of an intelligent assistant constantly placed on the two fragments, such as Mayor relates was done for a young lady of Berlin. Malgaigne suggests other less fatiguing expedients. This will serve simply to illustrate the difficulty which must usually be experienced in attempting to obtain an exact consolidation of the fragments without displacement. Dorsal splints, from the time of the iron cross of Roland Paul Arnaud, attributed to Heister, to the braces and other contrivances of the present time, used for the same purpose, inefficiently meet the requirements of fixing the scapula. The various modifications of the axillary pad only partially accomplish this object. The classical work of Malgaigne and the incomparable treatise of Hamilton, discuss the subject of fracture of the clavicle exhaustively.

Hamilton, very properly we think, uses an axillary pad composed only of a few layers of cotton batting enclosed in a cloth cover. This will obviously prevent undue pressure on the axillary vessels and nerves.

He remarks that a slight deformity does not cause, as we all know, any appreciable diminution of the strength or usefulness of the arm. However, to prevent a minimum of deformity should be our aim in the treatment of this fracture; and I will venture to express the opinion that to maintain the immobility of the fragments this modification of Richardson's splint which I show you, will meet this indication as well as any other available means. At least I found it so in one case treated a few months ago, although the subject was a lad fifteen years old. You observe that the apparatus is simple; made principally of pasteboard, and in fact can be readily improvised, and needs only a small roll of cotton covered with cloth for an axillary pad; a couple of pieces of adhesive plaster, one to fasten the apparatus to the body and the other to fasten it to the arm. The pasteboard should extend well behind, so as to nearly cover the scapula.

Fractures of both bones of the Fore-arm.—The most suitable position for an accurate coaptation of the fragments, and an exact consolidation without displacement, is the supine position of the fore-arm.

I make the following quotation from Hamilton's work on fractures, 5th edition, 1875, p. 341: "Says Mr. Smith in a note

to Cledius: 'In fractures of both bones, the fore-arm is best laid supine,' and Nelaton declares that in fractures of the radius and ulna at any point of their upper thirds, it will be necessary to supine the arm, both in the reduction and during the subsequent treatment; but that in fractures of the inferior two-thirds, we may place the limb in a condition of semi-pronation. It seems very probable, however, that both these gentlemen have received their suggestions from Mr. Longsdale, who, as we have already seen, has treated the question very much at length, and who has finally declared his decided preference for the supine position in the treatment of all fractures of the fore-arm." His arguments are certainly very ingenious, and as applied to fractures of the radius above the insertion of the pronator radiiteres, they seem altogether conclusive. "And indeed," remarks Hamilton, "they *commend themselves very strongly to our judgment, as applied to all fractures of the fore-arm.* They are sustained, also, by the results of his own experience, and I see no good reason why they should not be more thoroughly examined and tested by other surgeons. The advantages which he claims for this method are, more perfect coaptation of the broken ends, less liability of the fragments to encroach upon the inter-osseous space, and consequently less danger of anchylosis between the bones and of non-union of the fragments; more complete restoration of the power of supination, and less tendency to lateral displacement, or falling off at the ulnar or radial sides."

Hamilton, on p. 342, distinctly remarks that "his own cases treated by the usual method, *i.e.*, by semi-pronation, have shown that while supination is frequently impaired, and sometimes entirely lost, pronation is rarely effected; and that lateral displacements are *much more common than displacements forwards or backwards.*"

I wish distinctly in speaking of the treatment of these fractures to refer, as Hamilton does, to the use of thin wooden splints, suitably padded, for the anterior and dorsal surfaces of the fore-arm. Although Hamilton would, from the above lengthy citation, appear to express his preference for the supine position, yet it seems that he *usually* adopts the position of semi-pronation. I cannot, however, divest my mind of the weighty arguments of Mr. Longsdale, quoted by Hamilton, and I believe that usually, and especially in compound fractures, supination not only accords more accurately with the natural anatomical

conformation of the bones of the fore-arm, but that a certain amount of pressure, sometimes considerable, is required to be made on the palmar surface of the meta-carpal bone of the thumb, in order to maintain reduction of the fractured radius. Certainly it seems to me that supination is the most comfortable and the proper position in such cases. Semi-pronation in a non-fractured radius is as normal as supination; but when the bone is fractured and pronated, the weight of the fragments tend to destroy their apposition, which cause alone would be without influence in the supine position.

Mr. J., living a mile beyond Littleton, about two and a half months ago, was thrown from his horse and sustained a fracture of the bone of the fore-arm, at almost the union of the middle and lower thirds, with compound fracture of the radius. The fracture of this bone was oblique, downward and inward with slight projection through the skin by the upper fragment at a point on the dorsal aspect of the fore-arm, corresponding to the inter-osseous space. I treated him by supination, as indeed it was in this position that the radius could be maintained reduced, and the patient made comfortable. Mr. J. has made a good recovery—some stiffness remains about the wrist, which is gradually disappearing by passive motions on the part of the patient, and it is believed that the function of pronation will be gradually restored.

In bad compound fractures of the fore-arm, supination should, it seems to me, always take precedence over semi-pronation, but on this point I am not fully prepared to express an opinion.

Through the courtesy of Dr. H. A. Lemen, I was invited, with Dr. W. H. Williams, recently, to see a very bad case of compound fracture of the fore-arm in a lad about twelve or fourteen years of age, at the county hospital, and in which case there was considerable projection and denudation of the radius some weeks after the fracture. With a chain saw about two inches of the radius were removed. Certainly it would have been quite inadmissable in this case to have adopted the position of semi-pronation.

Fractures of the Femur.—To maintain the immobility of the fragments, and as accurately as possible their apposition, it is necessary in oblique fractures, in addition to extention and counter-extension, that the retentive apparatus should fix the pelvis as well as the thigh. It seems to me that this is an obvious prin-

ciple, which has been too much lost sight of, and notwithstanding the excellent results obtained with Gordon Buck's apparatus, which is the one that I prefer, yet I believe that a broad outside splint extending from the axilla to below the foot should be used with Buck's apparatus. Such a splint I have the pleasure to show you, which, it appears to me, you will find, if I am not mistaken, to serve a useful purpose in fixing the thigh and pelvis.

The peculiarity of this splint is that elastic extension and counter extension, if it is thought proper, may be substituted during the early part of the treatment for the weight.

Fractures of the Leg.—A plaster of Paris bandage from the base of the toes, to midway of the thighs, applied accurately and smoothly, when it can be carefully watched, is the most suitable way to treat a fractured leg.

I have obtained very favorable results by the use of this bandage in these fractures; but it has caused me much solicitude to know that all was going on well in the interval of my visits.

Fractures of the Fibula.—That fractures of the external maleolus or inferior extremity of the fibula are often mistaken for sprains of the ankle joints. In the July number of the *American Journal of Medical Sciences* of this year, is reported from the *Lancet of London*, that Dr. Sampson Gangee, surgeon to the Queen's Hospital, Birmingham, treats bad sprains of the ankle joint by immobilization with pasteboard splints moulded to the ankle and foot, bandaged and starched outside. This is a treatment that would apply equally well to unrecognized fractures of the external maleolus, or inferior extremity of the fibula. Malgaigne denies the frequency of this fracture. Hamilton only incidentally mentions it, and I am not aware that any English or American author treats even briefly of this fracture uncomplicated with fracture of the inferior extremity of the tibia.

Maissonneuve in 1840, published in the *Archives Generales de Medicine*, (vol. vii, Zēme Série, pp. 165 and 433) two lengthy articles on fractures of the fibula, and in which he describes the manner of producing one of these fractures on the cadaver by properly securing the foot and jerking the leg inward. It would consume too much time to further allude to Maissonneuve's interesting articles on this subject.

Nelaton well describes the symptoms of this fracture. It occurs from a sudden and violent twisting of the foot inward.

The external lateral ligaments are so strong that they will not yield, and the external malcolus snaps in a transverse line corresponding to the outer border of the lower extremity of the tibia. There is no displacement; rarely any crepitus, and the distingnishing diagnostic signs are, 1st, pain in an exceedingly limited and transverse liniar direction corresponding to the known anatomical seat of the fracture as produced on the cadaver. 2nd, a linear ecchymosis after a few days, which also corresponds to the line of fracture. In a sprain of the ankle-joint the pain is diffuse, and not confined to this region; although sprain may accompany this fracture. I am quite confident that I have observed this fracture a number of times, and indeed I believe that but for the weight of Malgaigne's dictum in this matter, that this fracture would be better known, and the teachings of Maissonneuve and Nelaton concerning it would have extended beyond their pupils. All that I would wish, however, is that attention may be called to this fracture, so that a more attentive examination of the external maleolar region in cases of supposed sprain of the ankle, may lead to its detection should it exist. The treatment is immobilization of the ankle-joint with a starch or plaster of Paris bandage.

ARTICLE XVI.

ON THE AGENCY OF MALARIAL INFLUENCES UPON THE DEVELOPMENT OF CROUPOUS PNEUMONIA.

By W. HUTSON FORD, M.D.,* of St. Louis.

The development of croupous pneumonia in the malarial districts of the Southwestern and Western States, south of latitude 36°, is worthy of attentive study, both on account of the great, and at times, almost epidemic prevalence of the disease and of its usual gravity. I propose to offer a few observations on this subject, and also on the treatment of this form of pneumonia, having had no small experience, from 1867 to 1875, in dealing with it in the States of Louisiana and Mississippi.

The sections of country to which my remarks will refer, though very distinctly applicable to the States of Illinois and Missouri likewise, whose climatology and topography differ but little from that of other States bordering on the Mississippi river, are characteristically malarial. At least one-half, and probably two-thirds, of the population of the Southwestern States, watered by the Mississippi and its tributaries, are subject to remittent and intermittent fevers, which, in the majority of cases, affect any given subject, not only every summer, but very often during the winter and spring also, sometimes during a period of many consecutive years. Few constitutions, therefore, can be found which are free from some mode of malarial impression, so that the entire population may be naturally grouped under two categories, viz: Those who are subjected to malarial impressions and react against them by occasional regular or ir regular paroxysms of fever, and those who, although equally subject to the same morbific agencies, nevertheless possess the power of resisting them by a non-febrile reaction, that is to say, by the peculiar movements of their nutrition. The relation of croupous pneumonia to these constitutional states I shall endeavor to sketch as briefly as possible in accordance with what I conceive to be its most rational explanation.

During the months of July, August and September, in the districts referred to, the air occasionally assumes a catarrhal dis-

*Read before the St. Louis Medical Society.

position, qualified by great reduction of humidity, with decided abatement of temperature, usually after rain and wind from the north or northwest. The irritating qualities of this dry air, more or less unusually ozonic, upon the respiratory passages, gives rise to various forms of catarrh, some of which become so prevalent as to be styled epidemic. In adults, catarrhal fever is often so generated, and when there has been a marked disposition to remittents previously, or the system has been unduly excited by severe or long continued heat and humidity, the catarrhal fever assumes the mixed form which, in the cities of the Atlantic and Gulf States of the South, is known as catarrho-bilious or break-bone fever. Children are also liable to this form of fever, but with them the catarrhal symptoms always predominate greatly. During the progress of the disease, both in children and the aged, pneumonic and pleuro-pneumonic complications are often developed. These secondary inflammations are especially likely to manifest themselves in children who are badly nourished or who suffer from chronic enteritis, and particularly in subjects of a dartrous or strumous diathesis.

The sudden fall of temperature with decrease of humidity and rise of the ozonicity spoken of, is productive of various other inflammatory affections of the respiratory tracts, besides catarrhal fever and secondary broncho-pneumonia, such as nasal and naso-palatal and pharyngeal catarrh, tonsillitis and laryngitis; and these meteorological states undoubtedly constitute the exciting conditions of many cases of diphtheria and true croup.

Aged persons, like children, are also subject to summer pneumonias of catarrhal type, but are much less liable to the nasal, pharyngeal and tracheal catarrhs. It is to be observed that in both the aged and in children, there is a marked disposition on the part of these summer pneumonias, which are nearly always secondary, as I have said, to diffusion through both lungs; hence their gravity. There is either an entire absence of expectoration, or the sputa are simply frothy and quite untinged with blood; only occasionally do we find a nucleus of prune-juice-colored exudate enveloped in the frothy viscosities. Nor does the affection ever pass on to hepatization of the lungs accompanied with production of pus. The lung becomes densely infiltrated with non-aerated mucus; it may become splenized, rarely hepatized. The bronchi are filled with viscid, frothy mucus, which is secreted very abundantly and expelled with great diffi-

culty. Cyanosis is marked, and death occurs by asphyxia. These summer broncho-pneumonias, I have always found exceedingly difficult to deal with, for they principally occur in badly nourished children, or in adults of more or less broken constitution, as far as I have observed.

They very often terminate fatally. The tendency towards rapid overwhelming of both lungs by effused liquid products must be accepted as the leading feature of the affection. The treatment, therefore, has very little in common with that of primary croupous pneumonia occurring in young and middle aged subjects; leeching or cupping in a few cases, but not blood letting, may be advisable. In adults counter-irritation should be very extensive. On the other hand, a watchful study of many years directed towards this point, compels me to condemn this measure in children under five or six years of age, as not only absolutely ineffective, but positively injurious. Opium should be scrupulously avoided whenever the symptoms point to threatened asphyxia. Our main reliance must be evacuants,—emetics in children, and in both young and old subjects smart purgation, practiced early and repeated frequently, even daily. Veratrum should be given in sufficient quantity to moderate the general excitement, but should *not* be pushed so as to bring the pulse quite down to the normal standard. I usually administer mercurials in small doses during the first forty-eight hours of the disease; toward its termination giving acetate of lead for a few days. Of course in bad cases, the supporting and stimulant system of treatment must take the place of every other. Antimony I have found exceedingly useful, but like veratrum, aconite and gelseminum, should be employed only with great circumspection, for the purpose of mitigating the general excitability and moderating the exhaustive labors of the heart. A judicious reduction of the force and volume of the pulse where these conditions are manifest, is of undoubted service in relieving the congestion of the lining membrane of the air-passages and of the finer fabric of the lungs, and so diminishing the hyper-secretion of mucus. It must not be forgotten that the special danger in this form of pneumonia is infarction of the lung-substance by the abundant and rapidly effused liquid products.

True croupous pneumonia, of which I wish to speak more particularly, is hardly ever seen in the sections of the United States above mentioned before cool weather fairly sets in. The

earliest cases occur about the period of the first white frost, and the disease becomes more frequent as the season advances. It is especially common during cold spells, sharply following protracted mild weather, prevailing habitually in the months of November, December and January, and disappearing almost entirely by the middle of February, or the first of March, not being seen again until the following autumn. It is, therefore, a disease characteristic of the late autumn and of mid-winter. When seen in the spring, it is secondary to croup or diphtheria, and to broncho-pneumonia if appearing in the summer. Under these latter circumstances, it manifests but little proliferative disposition, ie., there is only an incomplete development of true hepatization.

I have spoken of a certain class of individuals, who, although subject like others to all the malarial influences of the districts of country in question, remain, nevertheless, exempt from remittent and intermittent fevers, or almost so. This class is made up of old residents who have been subject to malarial fevers in former years, of younger subjects who have grown up in the country, and of a limited number who have never been attacked by the endemic fevers. I have found by extended inquiry and careful observation, that it is almost exclusively in this class of persons, who, by continued residence have become mostly acclimated to malarial fevers, that true croupous pneumonia appears. Gathering information on the subject from my patients, the response to a question whether the individual had had any access of intermittent or any remittent fever during the previous hot season and autumn, has been almost uniformly in the negative. Occasionally the occurrence of one or two chills, after some unusual labor, fatigue, or exposure has been admitted. Diet likewise, seems connected with the origin of this form of pneumonia, which appears mostly in persons who are well fed, but who subsist *during the summer* principally upon vegetables, fruits and salt meat, by such a diet, well recognized in the individual experience of the persons under consideration to be anti-pyrectic, usually succeeding in preventing and mitigating the attacks of malarial fever, which they have very seldom wholly escaped during the long and somewhat imperfect process of acclimation, to which they are subjected by the conditions of residence in a district of country, which for a breadth of area some hundred miles and more on either side of the Mississippi river, is highly malarial. A rich, organic, non-permeable soil, necessarily determines in a

warm climate where the rain-fall is heavy, the existence of numerous rivers with very extensive bordering swampy, and occasionally overflowed lands. The dense forest growth, and the fertile and moist soil, even at considerable distances from the rivers, supporting a heavy covering of tall grass and bushes, or fields of growing plants, combine to load the air with humidity. The woods are overflowed every year for some months; during the rest of the season the numerous pools and lagoons contain stagnant water. Along the Yazoo river, the Red, and the Big-Black rivers, the soil is in many places so highly organic, that it emits an exceedingly disagreeable odor, amounting sometimes to a stench when turned by the plow. Through the water of the woods and fields, especially in early summer, gases can be seen to bubble, when the sun shines hotly down through the water upon the organic accumulations of past years. These gases are very disagreeable to the sense of smell. The fogs have a peculiar unwholesome odor, and the localities where they hang are known alike to the white and negro population as peculiarly malarial. Even the Indian shuns them.

The rolling country is everywhere the least unhealthy, provided dwellings be built upon hill-tops and not in the bottoms. The banks of creeks, river-bottom lands, lying on the outskirts of the densely wooded swamps, are the most sickly. A habitation so located, and surrounded for purposes of shade by lawns covered with dense shrubbery, as on the larger and more valuable estates, is sure to develop malarial fever in a stranger, and to reproduce violent attacks often of a most congestive character in its accustomed occupants. In exceptional cases the annual recurrence of those febrile attacks develops visceral derangements of various kinds well known in the natural history of malarial fever, such as hepatic and splenic engorgement and chronic inflammation, functional disturbances of the nervous system, rectal, uterine and ovarian disorders; very rarely any permanent ascites or general dropsy, unless the kidneys or the heart be diseased. One of the most characteristic effects of the climate, as expressed in the frequent recurrence of attacks of fever, is in a disposition toward fluxes and chronic inflammations of the intestines and pelvic organs in both sexes. In the great majority of cases, however, attacks of chill and fever, repeated annually seem to affect the health but little; no inveterate visceral engorgement or chronic inflammation is established. As soon as

cold weather fairly sets in, the intermittent, ceases of itself or yields readily to mild mercurial catharties followed by quinine, and seldom recurs until the following April or May.

It is at first sight, therefore, a matter of surprise, that in spite of an exposure in common with the rest of the population to all the causes of malarial fever, a large class of persons should almost entirely escape. Such persons are exposed to the same humid and malarial atmosphere, work laboriously as farmers in the midst of rank vegetation under a scorching sun, or at other employments demanding, like carpentry, wood-chopping, ditch-digging, etc., quite as much, if not more, physical exertion. Their diet consists of vegetables of all kinds, fruits, fat though salt meat, eggs, chickens, butter and buttermilk without restraint, with coffee or tea, and fresh meat occasionally during the summer, but almost constantly during the colder months. And many persons of this class, who habitually consume the same kind of food both in summer and winter, capable in a semi-tropical climate, of promptly inducting fever in most constitutions, and tending to prolong the recurrence of its attacks far into the winter, nevertheless, escape fever altogether, or nearly so, and retain a good color, excellent appetite and digestion, and full strength, even when addicted to the intemperate use of alcoholic liquids in some cases.

However healthy such persons may seem, their proneness to croupous pneumonia, must be taken to signify that the systemic balances are in some way fundamentally disarranged. Their acclimation seems to have been excessive, so that by the very mechanism which enables them to ward off attacks of fever, they are rendered liable to congestions and inflammations of the lungs. The overaction of causes which prevent congestion in the greater circulation, induces congestion and consequent inflammation in the organs through which the lesser or aërating circulation is accomplished. This immunity from malarial fever, or ready triumph over it, can be accredited, I think, only to the high blood-making power these people enjoy. The perfection of their hæmatosis is evinced by the florid complexion, the muscular development and vigor which is characteristic of them. It is known by their constitutional history, by the full, temperate and strong pulse, the ample respiration and perfect accomplishment of the functions. We might say that their good health during the summer was owing to a perfect functional balance, were

there not adequate reason for denying the existence of this perfect balance, in the fact of the proneness to pneumonia and to pleurisy by extension from the lung-tissue, which is characteristic of their constitutional state.

The abnormally active hæmatosis which seems to explain the immunity from the effects of the pyretogenous influences and conditions alluded to, can be explained, I think, only by taking into account the functions of the lymphatic glands and the liver as blood-making organs. I have long thought, and in an article published in the July number for 1873 of the New Orleans *Journal of Medicine*, I maintained views to the effect that the action of the lymphatic glands in the elaboration of the lymph, constituted a most important element in the mechanism by which a febrile movement is abated or prevented, a point in pyretology which Murchison dismisses, I may say, with a sigh. Pyretological considerations as well as the anatomy of the adenoid tissue, lead us to think that this elaborate action must, to a great degree, consist in a local addition of oxygen to the lymph received from the tissue, and subjected to a very extensive contact with the corpuscular elements and blood of the highly vascular lymphatic glands. It must be assumed that even normally, the lymph of the tissues, if poured directly into the blood without previous lymphatic gland elaboration, would be competent to excite systemic disturbances of the nature of fever, and, where the lymph is more highly disposed toward fermentation than usual, that the fermentative disposition is annulled in the lymphatic glands by a more complete oxygenation than normal, if no systemic trouble appears. For it must be accepted as a law governing this subject, one which may be constantly observed in the phenomena of the reaction of fever, that the excitement of the fluids of the tissue and blood, which obtains in every febrile movement, is inseparably linked to a largely exalted affinity of those fluids for oxygen. The lymphatic glands, therefore, constitute a system of organs, whose function in this respect seems to be to act as barriers against the irruption of *excited* lymph—by which I mean *abnormally fermentative lymph*—into the system at large; and as their function consists mainly in oxygenative *elaboration* of the crude lymph, an expression which I suppose includes many acts at present unknown to us, so it is strictly dependent upon the quantity and oxygenating power of the blood which courses in such rich abundance through their

capillary network. I hold that fevers of the nature of those under consideration,are due to the entrance into the system from all the tissues of a crudely elaborated and therefore incompletely oxygenated lymph, which under the sytemic conditions inductive of the fever, has assumed a considerably higher fermentative potency than is normal; too great, indeed, to be annulled in the lymphatic glands, *without* the establishment of that temporary higher plane of nutrition which we call fever, which necessarily brings about a higher oxygenation of the blood and other fluids, *if health is restored*. It must not be supposed that this lymphatic-gland oxygenation is in any way designed for the "combustion" or neutralization of noxious matter in the lymph, (this is an act which finally occurs only in the blood torrent) but solely for the purpose of ministering to the abnormally exalted affinity of pyretogenous lymph for oxygen, as an element which it imperatively demands, not for its destruction, but in order that it may reach that higher phase of elaboration, after which it may be said to strive. According to these views, therefore, the higher the grade of blood oxygenation effected in the lymphatic glands, (and the cell-activity and proliferative development will plainly vary therewith) the more surely will the system be protected against irruptions of zymotic or pyretogenous lymph from the tissues, and their capacity for unusual work on the part of the lymphatic glands, in the way of stamping out or repressing the toxic influences of unelaborated fever-inducing lymph from the tisssues, will vary directly as the general perfection of hæmetosis and the richness of the blood in fully developed red corpuscles.

An access of fever, therefore, must be held to depend, primarily, upon defective elaboration in the lymphatic glands of excited tissue lymph and secondarily upon a generally defective oxygenating power of the blood. These conditions may be absolute or relative, inasmuch as the causes of fever may be extraordinarily intense, or the blood previously deteriorated by constitutional causes, by visceral or cardiac disease, or by the action of long continued heat and humidity and the inhalation of gases capable of destroying the blood corpuscles.

On the other hand, persons of the class we are considering, who remain free from fever or nearly so in a condition of more or less complete acclimation, in spite of the constant and full action of influences inductive of fever in those around them, can only do so by virtue of the habit of exalted sanguifaction which has

been acquired by their economy. Under the influence of a primary access of fever and the continued action of the conditions giving rise to it, the system has speedily acquired the faculty of generating red corpuscles, in sufficient abundance to withstand the effects of the climate. Urged by climatic heat and muscular activity, the consequent nutritive excitement, which in most cases would have induced chronic visceral engorgements and inflammations, in virtue of a happier susceptibility, has pervaded all the organs alike, and spent its special force upon those, the lymphatic glands and liver, most probably, whose office it is to elaborate the corpuscles of the blood. It is, however, only in very rare cases that this exact balance is attained, as shown in a complete insusceptibility at once to malarial fever and to croupous pneumonia. Ordinarily the habit of ready blood-making thus acquired is preserved, and this habit is continued after the warm season with its malarial agencies has passed, so that the quantity of corpuscles and general oxygenating power of the blood, soon after cool weather sets in, becomes excessive, with regard to the demands of the system, and a general disposition towards inflammation of the croupous variety is established. Under these circumstances the irritation of cold and dry air addressed to the lungs, exposure to cold and wet, the irritation of a highly ozonic atmosphere will induce a congestion of the lung tissue which soon passes into true inflammation. Indeed I believe that an attack of pneumonia may occur without any special irritation addressed to the air passages, provided the blood in the condition referred to be still further excited by the the more ample respirations and freer aborption of the oxygen from the air, dependent upon the declension of the atmospheric temperature; for it must be recollected that the more highly the blood becomes charged with oxygen, and the more numerous the red corpuscles, by so much, according to the laws of the capillary circulation put forth by Draper, does the circulation tend towards retardation and stasis in the lungs. This retardation, congestion, stasis and pulmonic inflammation is an acknowledgment of the error nature has made in overdoing her work; in battling successfully against malaria, she has exposed her subjects to the far more dangerous assaults of croupous pneumonia, whose establishment satisfactorily shows that the systemic balances had not been poised with absolute accuracy; that functional action had not been altogether harmonious; and that a

more or less complete immunity from malarial fever, can only be acquired by a constitutional reaction, which is essentially an imperfect one in the majority of subjects. At some future time I hope to offer a few remarks upon the treatment of the croupous pneumonia of malarial districts, with a citation of a typical case and some considerations based upon the personal conduct of twenty-four cases.

1611 Washington Ave., Dec. 15, 1877.

ARTICLE XVII.

A NEW VIEW OF PHYSIOLOGY. By J. C. DARBY, M. D., of Mt. Sterling, Kentucky.

When a child is born in perfect health, whose father and mother had been sound in mind and body during their entire life, and grows to maturity having enjoyed perfect health, the law of constructive assimilation has alone been active.

The laws of constructive assimilation and of destructive metamorphosis are like the tides. The ebb tide never begins to flow until the flood tide ceases; and so the flood tide until the ebb tide ceases. Physiologists, I believe, all agree that effete matter was once a part of the living organism, and that it is separated from the tissues or organs by or through the law of destructive metamorphosis. All effete matter is excrementitious, but all excrementitious matter is not or was not effete matter.

Time was when it was said that an animal body was changed in seven years, now science, so called, declares that animal bodies are changed in twenty-one days. Dr. Draper in his "Intellectual Development of Europe," makes a digression to say that a ton and a half of food and drinks passes through the body of a man weighing one hundred and fifty or sixty pounds in one year, all having been a part of his living organized tissues. Dr. Thomas King Chambers in his work called the "Renewal of Life," refers to the Morgue in Paris, and says that a dead body

there exposed does not undergo decomposition in so short a time as the body of a living person. As an illustration, he presents a brick wall, and says that we continually take out an old brick and put in a new one. The illustration is, I think, an unfortunate one, as this earth is not yet old enough to tell how long a brick will last. Dr. Dalton, in his learned work on physiology, makes a more accurate calculation than Dr. Draper. He weighed the amount of food and drinks of a man weighing, say one hundred and fifty pounds, consumes in twenty-four hours; and then gives with equal accuracy the amount of excrementitious matter thrown from the body in twenty-four hours; all of which is, according to him, effete matter. A man weighing from one hundred and forty to one hundred and fifty pounds, who swallows seven pounds and a half of food and drink in twenty-four hours, will thus be entirely changed in from twenty-one to twenty-two days. The entire system of modern physiology is founded upon this doctrine. According to it, there is not an atom of matter in the body of a living man to-day which was in it one month ago.

The food and drinks that we swallow are first mixed with the saliva, then with the gastric juice, and next with the pancreatic and intestinal juices, and with the bile, if you please. By these intermixtures the food and drinks are changed into three forms. The oily portions of the food are changed into what is called fatty emulsion. The amylaceous forms of food are changed into glucose; and the nitrogenous forms of food are changed into albuminose. Ordinarily the fatty emulsion is all, or nearly all, taken up by the lacteals and conveyed to the mesenteric glands, and thence to the receptaculum chili. There it is mixed with the lymph and passes through the thoracic duct to the vena cava descendens and thence into the right side of the heart.

The glucose and albuminose forms of food are taken up by the veins of the stomach and intestines, and then carried through the portal vein to the liver. From the liver they are carried through the hepatic veins to the vena cava ascendens, and through it to the right side of the heart. There meeting with the fatty emulsion, they are mixed together and pass thence into the lungs. Passing through the lungs they enter the left side of the heart through the pulmonary veins. When these three forms of food reach the left side of the heart they are called blood; indeed, I do not know that I should follow these three forms of food

as far as the left side of the heart. If they are not called blood as soon as they are absorbed from the stomach and intestines, physiological writers have taken no pains to say so. According to them the three forms of food are like so many race horses. They each and all rush to some particular part of the animal organism, there to become a part of the living tissues; or, if you please, to lay down a new brick in the place of an old one which has been removed. It will thus be seen that the roast beef and vegetables which you ate for dinner on Saturday, are to-day, Monday, a part of your body. The practice of medicine, which the most distinguished writers profess to call scientific, is based upon this physiological doctrine.

According to Dr. T. King Chambers, they have in the London hospitals night as well as day nurses, whose business it is to see that every patient drinks a certain quantity of milk or beef tea every three hours; and if the patient is asleep he has to be wakened. Science has forgotten Sancho Panzo. Milk and beef tea are the mildest forms of diet, and this stuffing is to put a new brick into the place of an old one, which, according to science, is continually passing out of the wall. This practice is not confined to the London hospitals. It may be modified, but it is pursued by the scientific physicians of both Europe and the United States.

I teach that when a man is subjected to starvation or is sick, that then the law of destructive metamorphosis begins in his body, and that while this law continues to operate, the law of constructive assimilation is suspended; that, so long as the starvation or sickness continues, no part of any one of the three forms of food absorbed from the stomach or intestines, becomes a part of the living organism; that when the starvation or sickness ceases, and the individual obtains food, or begins to get well, that then the law of constructive assimilation again begins to operate; and that then the three forms of food are ultimately changed into living organized forms. When the three forms of food spoken of are absorbed, I say that the conversion of the food into blood has then hardly began.

In this outline of the views I have elsewhere presented, I have to pass over much of the details of my illustration. Mr. Buckle, speaking of the wealth of nations, says that the principles laid down by Adam Smith would be equally true if every one of the details had been omitted. It would make my argument far

more forcible could I here give them, as they make the principles of Adam Smith so conclusive; but in an essay of this sort, details would make an article too long for a medical journal.

I teach that every gland in the body, except the reproductive glands, is exclusively and entirely engaged in the conversion of the food into blood, preparatory to the formation of tissues from the blood. I here speak of tissues in the sense of Bichat.

I will now endeavor to show how the food is converted into blood. I have said that the oily portion of the food, or fatty emulsion, is conveyed by the lacteals to the thoracic duct, and thence to the right side of the heart. In its passage through the mlsenteric glands, it is subjected to certain vital changes. Virchow says he saw white corpuscles as they came out from those glands. They are formed or generated by other lymphatic glands.

The two forms of food which pass to the liver through the portal vein, are there subjected to certain vital changes necessary to their becoming constituent parts of the blood. Bichat observed, in the early part of this century, that the bile begins to be poured into the duodenum almost immediately after digestion commences. I teach that this bile, the clear and comparatively sweet bile, is an excrementitious substance formed from glucose and abuminose forms of food as they pass through the liver; that this bile is a substance necessarily separated from these forms of food in their metamorphosis into the constituent parts of the blood. Physiologists teach that two pounds and a half of bile are ordinarily secreted by the liver of a healthy man during every twenty-four hours. I say that the greater part of this bile is formed from the food as it passes through the liver. There is another form of bile—the dark, viscid, bitter bile. I hold that this form of bile is formed from effete matter brought from the abdominal organs in its return to the right side of the heart.

It is not denied that all of this blood has to pass through the liver before it reaches the vena cava ascendens. This conversion of effete matter into bile is effected by the liver for the most part after the forms of food referred to have passed through the liver. The consideration of this particular question would involve other questions relating to pathology, which I have not now space to consider. Suffice it to say that I teach that the larger part of the bile in health is formed from the food

as it passes through the liver, and that a lesser part is formed from effete blood as it passes through the liver. No physiologist teaches that bile is thus formed, or that it is formed from the elements and substances out of which I say it is made. Dr. Murchison, in his valuable little work on "Functional Derangements of the Liver," says that the bile is formed from the albumen in the blood. I believe that physiologists generally agree with him. Not one of them, so far as I know, has ever taught that a portion of the bile, and, as I believe, a large portion, is formed from the food as it passes through the liver, and they all deny that any part of the bile is formed from effete matter.

Effete matter is, according to them, separated from the blood and thrown off from the body by two organs, the lungs and the kidneys, but particularly by the latter. I believe they also teach that effete matter is to some extent thrown off by the skin. Were they to allow that the bile is formed from effete matter, they would be compelled to admit that the bile is an excrementitious substance; because they all teach, and they are compelled to teach that effete matter is a substance which has to pass out of the body. This denial, that the bile is formed from effete matter, involves them in the assumption that the bile is an incrementitious and not an excrementitious substance; and also involves them in the other assumption, that the bile is continually reabsorbed. There is some little qualification as to the reabsorption of the bile. Cholestrine, one of the fractional parts of the bile, is, they say, converted into sterchorine, and thus passes out of the body. But the general assumption that the bile is for the most part reabsorbed, and that it is not entirely and altogether an excrementitious substance, involves them in a dilemma. To answer this difficulty Claud Bernard had discovered, and the so-called scientific medical world is in acclamation at his discovery, that the liver possesses glycogenic functions, and that it is the special function of the liver.

Sugar, under some one of its forms, is said to be sometimes found in the blood of the hepatic veins. I think it more than doubtful that it ever was there found when the animal, the blood of which was examined, was in *perfect health*. Bichat said that physiological laws could not be discovered when the body of the animal experimented on was in torture. I agree with him. It is the function of the liver to change the two forms of food, glucose and albuminose, coming to it from the stomach and in-

testines, into something nearer akin to blood. When we consider how large a portion of our food is of a saccharine composition, it is strange that the liver is sometimes unable to change it, and that it passes into the hepatic veins as sugar.

Ordinarily the fatty emulsion coming up through the thoracic duct to the right side of the heart is so changed in its passage through the lungs that it does not appear as fatty emulsion in the blood of the carotid artery, but sometimes it does there so appear. In the same manner sugar sometimes passes through the liver, and is found in the blood of the hepatic veins. But it is said that sugar is found in the hepatic veins of animals which feed entirely on flesh. This may be a fact. I doubt it. To make the most of Claud Bernard's discovery, all that can be said of it is, that when the liver acts upon the glucose and albuminose, which comes to it intimately mixed together, it separates from them substances, out of which it makes the sweet bile; and that, in that separation and vital action upon these forms of food, the one of them, the glucose, may be changed into glycogen. I hold that one of the functions of the liver is to change the food into something nearer akin to the constituent parts of the blood.

These two forms of food having thus been acted upon by the liver, pass on to the right side of the heart. They there meet with the fatty emulsion, which had already been subjected to the action of the mesenteric glands. These all mixed together with a great quantity of lymph, pass directly to the lungs, where they are acted upon by the inspired air. It is supposed by physiologists generally, I believe, that some portion of the food is consumed as it passes through the lungs, in the production or generation of animal heat. I doubt this, for the food has not yet been subjected to all the glandular action necessary to its conversion into the constituent parts of the blood. When these three forms of food reach the left side of the heart, having already been subjected to the vitalizing action of the liver, of the mlsenteric glands, and of the lungs (for in this sense I consider the lungs to be the glands), they are distributed to all parts of the body. They have yet, however, to be subjected to the action of other glands before they can be called blood.

The lymphatics, like the veins, originate in all parts of the body. In a physiological sense, the lymphatics separate from the blood in the artereoles certain parts of the food, which they carry to the lymphatic glands, where it undergoes another vital

action. From these glands it passes on to the thoracic duct. Lymph corpuscles or white blood corpuscles are found in large numbers in the lymph, as it is about to pass into the right side of the heart. When these corpuscles have passed through the lungs and on to the left side of the heart, they no longer appear in the blood of the carotid artery, for instance, except in the proportion of one white corpuscle to three hundred red ones, which, according to Virchow, is their normal proportion in the arterial blood of a man in perfect health. They became red blood corpuscles in their passage through the lungs. Considering the size of the kidneys, a very large quantity of arterial blood is sent to them. For what purpose is it sent? This arterial blood sent to those organs contains three forms of food which is to be subjected to another elimination in the kidneys. They have to separate a large portion of the liquids with which the food had been mixed up. I refer to the saliva, the gastric juice, the pancreatic and intestinal juices. They also separate certain solid constituents, all of which are poured into the bladder. Recent physiological facts have shown that the purest blood found in the body is that coming immediately from the kidneys. It is because the food under its three forms had been subjected to one of its last eliminations in its passage through those organs. The renal veins convey to the vena cava this pure blood. The glands of the skin have also to perform their part in the conversion of the food into blood. This they do in the elimination of watery parts, which they throw off as insensible perspiration.

This is the round of the changes and glandular actions to which the food is subjected before it becomes blood, or can properly be called blood; but it has to be subjected to another large gland. I refer to the spleen. The blood which comes from the spleen has a larger amount of fibrine in it, than had the blood which was conveyed to it through the splenic artery. I believe it also contains a larger number of white blood corpuscles. The spleen is continually pouring into the portal vein rejuvinated blood. It is out of the blood thus prepared or made, as I have so fully stated, that the tissues are formed. This formation or constructive assimilation goes on from the beginning of life until the man or woman has arrived at mature growth. During all this time the excrementitious matter thrown out from the body was separated from the food.

I affirm that no effete matter was separated from the tissues during all this time, if the individual continued in perfect health. After the individual has arrived at mature growth, the food which had up to this time been formed into the living tissues, is now used in maintaining the strength, the animal heat, and all other functions, without being metamorphosed into living organized tissues or parts of the body. It is then, and then only, that the excrementitious matter corresponds so nearly in weight with the amount of food and drinks swallowed. When a growing child is gaining a pound a day in weight, there can be no such correspondence. Indeed, some physiological writers maintain that pigs sometimes increase in weight beyond the amount of food and drinks consumed.

The notion that destructive metamorphosis is continually going on in healthy animals, thereby separating from the tissues effete matter, involves another difficulty. What becomes of this effete matter? A large part of it they say is separated from the blood by the kidneys. I teach that neither effete matter nor effete blood ever reaches the left side of the heart. When it is separated from the tissues and emptied into the veins, it is removed from the blood by the liver forming out of it the viscid, dark, bitter bile. The liver takes from the blood all effete matter brought to that gland through the portal vein. It changes it into bile, which is an excrementitious substance. The lungs also separate effete matter, when there is any, from the blood, and throw it off as carbonic acid gas. When there is no effete matter, the lungs throw off effete blood as it passes through them. When the blood is not converted into tissues, it becomes itself effete, and has to be thrown off from the body by the liver and lungs. But physiologists teach that effete matter, which is continually being separated from the tissues, is formed into urea, cholestrine, etc.

Dr. Murchison, in the work already referred to, says that one of the functions of the liver is the production of urea, and that sometimes the liver generates or makes uric acid or the urates.

Where glands or organs are provided for every distinct function, as in the bodies of the more fully developed animals, it is contrary to the uniform simplicity of nature for any one gland to perform three or four functions entirely different.

In pathalogical conditions, glands may act vicariously for each other, but it is not so in perfect health. It is the especial

function of the kidneys to separate certain parts from the food, which they form into urea, and every other thing found in the bladder. They are as much organs engaged in sanguification, as are the salivary glands, the stomach, the liver and the lungs.

If the liver formed urea out of any part of the blood, that urea ought to be immediately put into a channel which would remove it from the body. It ought to pass from the liver along with the bile and be poured into the duodenum. But physiologists teach that the urea formed by the liver passes through the hepatic veins into the vena cava. A poison thus formed is sent into the general circulation to be distributed to all parts of the body. If it were possible to conceive that urea is ever poured into the vena cava of the healthy man, it ought to be separated from the blood as it passes through the lungs, and thrown out of the body along with the expired air. But such is not the doctrine of the schools. They teach that urea and several other poisons enter the left side of the heart and are distributed to every part of the body. I say they teach this unless they suppose that urea and other poisons are taken by some elective affinity through the renal arteries to the kidneys, there to be separated, as they say, from the blood. The whole thing is an absurdity.

Article XVIII.

The Present Status of the Pathology of Phthisis Pulmonalis.*—By J. Hilgard Tyndale, M. D., of New York City.

I propose in a series of papers written at my leisure, a condensed outline of the present accepted theories in regard to the pathology of pulmonary phthisis. I have not attempted it before on account of the vast range of the subject, and the labor required in sifting new from exploded theories, so as to give anything like a correct outline.

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* The above paper is the introductory one of a series, written at short intervals to a fellow-practicioner in a small town. At his suggestion they are now submitted to the profession at large, with such slight alterations as the circumstances of the case seemed to call for. J. H. T.

At the outset, however, let me not encourage anyone to expect anything original. Very little of what I write will be absolutely new in itself, but the usefulness of my attempt, I trust, will be apparent when I say that it will be my endeavor to present a *correct and distinct outline of the present status of the pathology of pulmonary phthisis, or consumption*, according to the very latest accepted theories, and confining my own observations to a few points, which which will be duly chronicled in their proper place.

The true pathology of phthisis is far from being settled. Some writers of late, however, have asserted that the question is as much a muddle as ever; their opinion, it seems to me, to be slightly tinged with a feeling of general disgust for the subject. We should therefore dismiss from our mind the idea that the pathology of phthisis will ever be brought down to represent *one single condition and its consequences*. There is no need of apologizing if, previous to taking up the question proper, I give a rapid outline of the various theories which have been accepted from time to time.

The first tangible theory was Laënec's, that of tuberculosis and consumption being synonymous and inseparable. Small, gray nodules (tubercles) were found in the lung and digestive tract, etc., and certain changes, such as ulceration, destruction of tissue, more or less attributable to them, were found. Next certain other larger knots were found in the lungs (*cheesy degeneration*), together with solid infiltrations of considerable extent, which were in no wise connected with tubercle. The first were denominated *yellow tubercle*, and considered quite distinct from the *gray* (true tubercle). Infiltrations and indurations were pronounced to be concomitants of both yellow and gray tubercle, and both allowed to undergo the same processes of degeneration by formation of caverns and leading rapidly to destruction. In other words, the division was into *tubercle proper* (miliary tubercle of present date) and *infiltrated tubercle* (infiltration generally), both subject to caseous degeneration, which process was denominated "tuberculization." Therapeutics varied accordingly. Bleeding, vesication, fontanelles, etc., were supplanted by leaf-tea, milk, eggs, meats and malt liquors, with opium and its preparations as a final sheet-anchor. Need I say that the rate of mortality was not decreased by this cause?

The establishing of pathological anatomy as a special branch

of our science made us acquainted with the various forms of degenerations. Fatty, amyloid, the proliferation of connective tissue with subsequent contraction (cuibotic conditions) and based chiefly upon the latter form, it was held that this was a decided step toward the ultimate cure of phthisis, to-wit: By cicatrization of cavities. Reference to this will be made in a future paper. But we are forced to agree with Prof. Buckle, of Bonn, when he says: "The fact of a phthisical patient dying of dropsy instead of consumption, can never satisfy the sincere therapeutist."

Next in order of theories we have the *resemblance of consumption to inflammatory processes,* based upon the illustrations of Caswell (1838). It was demonstrated to what great an extent the smallest bronchi and the alveoli of the lungs were affected in tuberculosis; how the changes pass into the neighboring parenchyma, and bronchi become dilated, and by dilatation finally form cavities. Again, much stress was laid upon the proliferation of connective tissue and its consequent cicatrization, and this process was held to be the basis for final healing of cavities by induration. The fact, however, remained, that breaking down of the products of chronic inflammation, was by far the most frequent result, both in the greater number of cases as well as in the extent of tissue involved in; short, that cheesy metamorphosis was the prominent characteristic. Thus originated chronic pneumonia with cheesy degeneration (caseous pneumonia). The conclusion derived from this was the recognition of tubercle in two distinct forms once more, namely: Miliary tubercle (the tuberculum nodule), and the infiltrated tubercle, recognized as the result of the cheesy degeneration of inflammatory products.

It was not long thereafter, that miliary tubercle was found to be a new formation (neoplasm), and since the products of inflammatory processes could not be placed with neoplasmata, it became plain that the term "tubercle" would not answer for both conditions.

In order, therefore, to determine whether tubercle and cheesy products were identical, inoculation upon animals was resorted to, and with the following result: Inoculation of the products of cheesy degeneration produced both miliary tubercle and cheesy products in the inoculated animal. Right here, it is well to bear in mind the possibility (and, according to late researches, the probability) of having genuine tubercle intermingled with

cheesy products in the mass to be inoculated. The inoculation of miliary tubercle, however, produced miliary tubercle alone, so that, as to whether cheesy products can be brought about by tubercle direct or as a subsequent result, has as yet not been definitely settled. At least no positive results have been obtained.

So it would seem that thus far, at least, the identity of the two remains undisturbed, that in a general sense tubercle and caseous degeneration are convertible.

It has been demonstrated that in animals a cheesy infiltration may call forth tubercle-efflorescence, the same as in the human being, where general or local miliary tubercle (e. g. of the meninges, meningitis basilous) can be produced by the presence of cheesy aggregations, usually having their seat in lymphatic glands.

What has been said will suffice to make it clear to the mind, that a thorough knowledge of the acute inflammatory conditions of the lung must of necessity precede an investigation into the pathology of consumption and tuberculosis. In subsequent papers, therefore, it will be my endeavor to sketch the acute lung affections (catarrhal, croupous, etc.), following them to their possible chronic conditions, and add to these the primarily chronic inflammations of the lung (interstitial pneumonia, chronic desquamative pneumonia); next treat of that chronic condition, which may result from either of the foregoing, namely: Caseous pneumonia, and lastly, of tuberculosis proper, both as an acute infectious disease, as well as in its relation to caseous degeneration and to scrofulosis.

Before closing this first paper, I feel it incumbent upon me to draw attention to a few of the more salient points in the anatomical and physiological relations of the lung, so necessary to a thorough understanding of the pathology of phthisis, the more as a few points I will mention are of recent origin, and dwelt upon in the work of Buhl, of Munich, from whom I quote:

"In sifting the inflammatory conditions of the respiratory organs, you will find some of them taking place and running their characteristic course in the epithelial surface of bronchi and lung alveoli. These processes may thence be termed superficial. Other conditions manifest themselves in the walls proper of the bronchi and the adjacent actual parenchyma of the lungs themselves. Not that there is a strict division into superficial and parenchymatous inflammations, since in many processes both are

more or less affected, but one of these processes is always secondary to the other."

A very important point, and one to which I desire to draw attention particularly, is the epithelial layer of the alveoli and its physiological character. Buhl in his excellent work, while acknowledging the existence of epithelium, both in fœtal and adult age, ascribes to it the characteristics of lymphatic endothelium, spread over the inner surface of the alveoli, and not those of a continued bronchial epithelium. He proves this by drawing attention to the form and size, and the oft' asserted fact of its being "interrupted," which is likewise, and only found, in the endothelium of serous membranes. Accordingly, bronchial epithelium passes into alveoli endothelium, as tubular epithelium is followed by endothelium in the peritoneum.

Another striking proof is found in the experiments of Sigorsky (*Centralblatt*, 1870, No. 52), showing the existence of a network of lymphatic vessels, consisting of canaliculi and stellate knots uniting them in the alveolar walls, which knots communicate with the volume of the alveoli by means of minute openings. It would appear proper, therefore, to look up the alveolar pouches as wide lymph-spaces, filled with air and lined by endothelium, which endothelium is wanting in the lymphatic network of the alveolar walls. These relations are of importance for the exchange of gases in respiration, since the inspired air meets with no absolute resistance within the walls of the air-cells, which would not merely permit of diffusion of gases through the capillary walls, but of a direct entrance into the open lymphatic network of the alveoli.

Lastly, attention has been called by several authors to the analogy between the alveolar epithelium and the endothelium of the lymphatics, more especially as regards their products in pathological processes. It is well to remember that authors, speaking of superficial inflammations, thereby designate such forms, the products of which are chiefly generated in the epithelium or pass over its surface; while the products of parenchymatous inflammation are interstitial and peribronchial.

The vascular system of the respiratory organs, likewise, call for a moment's attention. It is well never to lose sight of the fact, that the arteries proper of the lungs are not the only ones, but that the bronchial arteries likewise may play an important part. The bronchial arteries have a share in the capillaries of

the pulmonary organs, and therefore take a part in the disturbances of nutrition of lung tissue. The bronchial arteries run an interstitial, interlobular course, finally branching out on the pleuræ, while the arteries of the lung proper form the great bulk of capillaries in the alveoli.

It follows, therefore, as a general rule, that peribronchial inflammations and parenchymatous infiltrations of the lungs are within the territory of the bronchial arteries, whereas the superficial inflammatory conditions (exclusive of the bronchi) are within the territory of the pulmonary arteries. It further explains the involving of the pleura and bronchi in original maladies of lung parenchyma, as well as the possibility of an extension of bronchial or pleuritic disease upon lung parenchyma, and on the other hand the well-established regularity in the appearance and character of one or the other of the diseases named, to-wit: Primary disease of lung parenchyma is more diffused, more continuous in accordance with the capillary distribution; in other words, it is lobar; whereas, primary disease of the bronchi always leaves certain bronches free, and even when spreading to the lung parenchyma will, at first, be lobular, or even remain so. In other words, diseased lobules are contiguous to, and surounded by, relatively healthy ones.

The same thing may be said of thromboses and emboli. Ordinary thromboses occur in the usually dilated capillaries, which are fed by the arteries of the lungs, and create lobar trouble the so-called pyæmic plugs (emboli) in the finer arteries of the lungs are, though small, distinctly lobar as regards their seat and extent.

Intermediate between the lobar and lobular form, we place such disorders which originate in the lymphatics. Of these, Prof. Buhl says: "As the finest ramifications of the lymphatics follow the course of the bronchial arteries in the alveolar walls, running their course interlobular, interstitial and peribronchial, congregating at length partly in the subserous pleural tissue, partly in the lobes of the lung, so is their pathological progress either continuous and diffused, or confined to lesser spaces, to mere points; or thirdly, both conditions may exist simultaneously and a doubt may arise as to whether they should be called lobar or lobular.

There remains still another point for examination. It is that an acute pulmonary trouble will present itself quite different

from a chronic one. Inflammations, either superficial or parenchymatous, whether lobar or lobular, will present quite different features when of acute than when of chronic origin. If acute, of recent and sudden origin when examined, they differ widely from chronic inflammations, whose chief characteristics are degenerations of great extent when superficial. On the other hand they are characterized by proliferation of connective tissue, cicatrization, etc., when such chronic inflammations are parenchymatous, interstitial or peribronchial.

In either case, it will be well to remember, that in an inflammatory process, whether acute or chronic, where secretions are not expelled, but remain in the respiratory passages, as well as when tissue is being disintegrated or destroyed, the contact of atmospheric air (peculiar to the respiratory organs) exercises a disintegrating effect upon the infiltrations, in which the whole body participates. This is seen in shape of fungi, which enter the blood and lymphatic vessels through the decomposing tissue.

ARTICLE XIX.

MEDICAL EXPERTS* AS WITNESSES IN COURTS OF JUSTICE.—II.

By F. T. LEDERGERBER, ESQ., of St. Louis.

Matters submitted to experts for their opinion, must lie beyond the scope of the observation, knowledge and experience of men in general; therefore, the jury cannot be presumed competent to arrive at a proper determination by the unaided exercise of their judgment on the facts to be submitted to them.[1]

*Scientists as experts are those who are called upon to give their opinions in Court, and comprise lawyers, doctors, and other scientists: experts, all persons skilled in any art, book-keepers, mechanics and merchants in regard to customs of trade, etc.

1. See Greenlief on Ev. S. 280, 440. Starkie on Ev. 96.

NOTE.—The cases referred to in the January No., on pages 47 and 48, are 26, Conn., 463; 2nd on page 48, 3 Ind. Rep. 497; on page 49 1st 4 Ill. Rep., 15.

The reason that experts are called on to give their special knowledge in evidence rests on the ground of public policy. The proper administration of justice is for the benefit of all in a free community, and upon it rests the security of life, liberty and property. The case on trial is not merely the issue between the parties to the same, but is a test of certain rules of law in which all have a common interest. This interest of the public demands that all the light necessary to a just and complete understanding of all the facts in a case be adduced before the jury at the trial. It has been decided, that when a question arises in a case concerning the bodily injury a party has sustained, justice demands that he should submit to an examination by physicians, in order to determine the extent of the same, beyond his own testimony. That if he fails to submit to this, he is guilty of contempt of Court, and may be punished.[2] Therefore on questions of science or skill beyond the scope of the observation, knowledge and experience of men in general, scientists and experts are called upon for, and compelled to give an opinion. The rule of law is declared by the Court in its opinion or charge to the jury, and scientists or experts must aid the Court by throwing light upon subjects, they, and they alone, thoroughly understand.[3] The benefits the people derive from a proper administration of public justice, demands this, not the advantage to the immediate parties; for the loss or gain of the parties to an action in that action is of no public importance, while the rule of law established or maintained is of the greatest moment. A person subpœned as a witness is therefore declared to be an officer of the Court,[4] and must aid the Court with his knowledge. For the same reason he is protected from arrest in certain cases and from being served with process in others[5] while attending Court. This is to protect a witness while in attendance and secure attendance from beyond the jurisdiction of the Court, in some instances from outside of the county, in others from outside of the State.

Since the first article published in this journal, an opinion recently delivered by the Supreme Court of Alabama, has been

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2. St. Louis Cen. Law Jour., Jan. 18, 1878, p. 47. Schroeder vs. C. R. J. P. R. R., to appear in Iowa Rep.
3. Folkes vs. Chadd, 3 Douglas, 151.
4. 26 Conn., 463.
5. The King vs. the inhabitants of Holy Trinity, 26 Eng. C. L. Rep. 41. 3 Duer N. Y., 622.

published in advance by the *St. Louis Central Law Journal* of Jan. 4th, 1878, sustaining the views of the writer in the article mentioned. A physician, Dr. J. J. Dement, was introduced as a witness for the State, the solicitor stating that he desired to examine him as an expert. After testifying that he was a physician—that he had seen the deceased and examined a wound which the prosecution asserted had produced death, he was asked to state the nature and character of the wound, and its probable effect. This he declined to do on the ground that he had not been remunerated for his professional opinion, nor had compensation been promised or secured. The Court informed him that it was his duty to answer, and upon his declining to do so, fined him. This fine he moved to set aside, on the ground of illegality, because the Court had no power to compel him to testify as a professional expert, unless compensation was first paid or secured. The Court below overruled the motion and Dr. Dement appealed to the Supreme Court of Alabama.* The Supreme Court affirmed the judgment of the lower Court, that a scientist or expert cannot withhold his opinion in Court because no extra pay has been paid or secured to him, without subjecting himself to a fine for contempt for refusing to do his duty towards the Court.

This is a decision of a Court of last resort, rendered directly upon the point in controversy and can only be reviewed by the Supreme Court of the United States. If taken there by appeal it will in all probability be affirmed.

Ordroneux's Jurisprudence of Medicine holds of experts testifying, that they are advisers of the Court, *amice curiæ* rather than parties interested in the trial, and that this fact, he says, it is painful to confess is too much ignored by both counsel and Court.

In England, as before stated, scientists and experts receive special compensation under the provisions of 5 Elz. ch. 9, which enacts that the witness must have tendered to him, according to his countenance, or calling, his reasonable charges. Up to this time we have no such statute in any of the United States.

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*In this opinion the Court reviewed the cases pro and con: matter of Roelkner 1 Sprague Rep. 276, Collins *vs.* Godfrey, 1 B. and Ad. 950. Lonergan *vs.* Royal Exchange Assurance, 7 Bingh. 731. Webb *vs.* Paige, 1 Carr and Kirw. 23. The case is entitled Exparte Dement, and will be found in the Alabama Reports about to be issued.

and it is questionable whether one ever will be passed, and if passed, what the effect would be.

In France in cases where a proper administration of justice requires the opinion of physicians, or rather scientists, the Court, under a statute to this effect, either upon its own motion, or on motion of the parties, appoints a commission of scientists. The duty of this commission is to investigate this question and report their opinion to the Court, where it prevails on that subject in that case, unless set aside by the Court for good reasons, or attacked on the ground of partiality or fraud in open Court. The fees of the members of such commission are fixed by the Court.

In Germany the Court may appoint either a commission or call eminent scientists or experts to its assistance and, to some extent, fix their fees. Thus do not only opinions, but laws, differ, and it is for the professional men to suggest the proper remedy to the legislative branch or branches of our government. The *modus operandi* of France and Germany has much to commend; and a thorough investigation of these provisions by the legislatures could harm no one.

A question of interest to the scientist or expert is where he is allowed or compelled to give his opinion in evidence. In these articles, the theory upon which he is compelled to give up his special knowledge, his capital in trade, so to speak, has been to some extent, elaborated and some of the reasons therefor attempted to be given. The introduction of this testimony is governed by rules of law, defined in a number of adjudicated cases, constituting precedents.

It must first be shown that the witness produced and sworn in Court is skillful or scientific, or at least that he has superior actual skill and experience or scientific knowledge.[6] This may be shown by the witness himself, and the judge must determine whether the witness is a scientist or an expert.[7] When the Court is satisfied as to this fact, his examination may proceed.

In Page vs. Parker, *supra*, it was held that upon questions of science or skill, men who have made the subject matter of inquiry the object of their particular attention or study, may be

6. Page vs. Parker, 40 N. H., 47. Hart vs. Vidal, 6 Cal., 56. Emerson vs. Lowell Gas Co., 6 Allen, 146. Cook vs. Parkham, 24 Ala., 21; also 390. Blakemore vs. Johnson, 35 Ala., 252.

7. Bery vs. Reed et al., 53 Maine, 487. Tullis vs. Kidd, 12 Ala., 648.

called upon to give their opinions in evidence, and have no legal right to refuse.[8] It must be a subject upon which the jury are supposed not to have the same degree of knowledge as the witness.[9] The opinion must be confined to questions of science or skill; opinions on legal or moral obligations are not admissible, as to the manner in which others would be influenced in case the parties had behaved in one way rather than another. For upon this subject every man of ordinary intelligence is supposed to be conversant and competent to draw a correct deduction from the facts presented. In Page vs. Parker, *supra*,[10] the Court held that a mere opportunity for observation was not sufficient to qualify a scientist or expert to give his opinion, and a physician in practice several years, but who has no experience as to the effects upon the health of breathing illuminated gas, cannot be allowed to testify in relation thereto as an expert.[11] A mere opinion about the probable effect of the husband's conduct on the wife is inadmissible,[12] nor upon statements of the attending physician, with whom he was called to consult, coupled with a statement of the attending nurse and personal observation made. His opinion should be formed entirely upon his own examination of his patient;[13] or a hypothetical case. Nor can he be asked whether a physician in refusing to consult with another physician had honestly and faithfully performed his duty to the profession. If the rules of the society were offered in evidence, would a question whether he complied with them be competent? It seems admissible in a criminal trial, to ask an expert, a chemist, whether a scientist or physician, can determine with any degree of certainty from a post mortem examination the period of time when certain inflammation was caused.[15] A person not a scientist or expert cannot testify as to the value of the services rendered by a scientist.[16] This is a plain and just rule.

Frequently it becomes difficult to determine whether the evi-

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8. Folkes vs. Chadd, and Hart vs. Vidal, *supra*; 10 Ga., 511, 4 Wend., 320.
9. Lowers vs. Dukes, 8 Minn., 23. 49 Mo., 274. Kennedy vs. People, 39 N. Y., 245. Cook vs. State, 24 N. J. L., 843. Conn. R. vs. Greely 23 N. H., 237.
10. See also McLean vs. the State, 16 Ala., 672.
11. Emerson vs. Lowell Gas Co., 6 Allen, 146.
12. Richards vs. Richards, 37 Penn. Rep., 225.
13. Healy vs. Thing, 45 Me., 392. 35 Ala. *supra*.
15. The People vs. Harking, 4 Parker N. Y., 319.
16. Hart vs. Vidal *supra*.

dence offered is scientific or requires skill or experience, and upon this question differences of opinion prevail. Among others, it has been decided that an inn-keeper will not be allowed to testify that a guest locking up his money in his trunk was guilty of negligence,[17] nor how much, in the opinion of the witness, was the damage sustained by the plaintiff.[18] Any person can give an opinion whether a person was drunk or sober, from the acts of the party.[19] Unless other facts than the appearance of the party are introduced in evidence, an opinion as to his probable age is inadmissible.[20]

Eminent physicians have refused to answer questions like the following: Suppose a delicate woman three months pregnant, and for the last four weeks otherwise sick and weak, should be seized by a heavy man and thrown upon the ground, what would be the probable effect upon her in regard to a miscarriage? The reasons assigned by the physicians were, that unless they knew the amount of violence used to throw the woman upon the ground, the fright it gave her, how she fell, they could not answer, and when asked, suppose a miscarriage followed? their objection was, that if the fact of the miscarriage did not answer, science could not.

Physicians may refresh their memories from books, and when produced in evidence, refer to them. There are cases, however, which hold that they can refer to them without producing them. The former rule is believed to be the best.[21]

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17. Taylor vs. Mormot, 4 Duer, 116.
18. Norman vs. Wells, 17 Wend., 136. Shephard vs. Willis, 19 Ohio, 142.
19. The People vs. Eastman, 14. N. Y., 562.
20. Morse vs. State, 16 Conn., 9.
21. St. Louis Central Law Journal, 1877, Vol. 5, No. 24.

Translations from the German.

Bloodless Operations.* By Prof. F. Esmarch. Translated for The Journal by Ed. Evers, M. D., of St. Louis.

I have always considered it an important duty of the surgeon to be as saving as possible with the "noblest juice" of the patient entrusted to his care; and ever since 1855 I have been in the habit, before every amputation, of applying linen bandages to the parts to be removed, so as to force out the blood circulating within them. I was led to do this by an amputation of the thigh, which I performed for a very large osteosarcoma. After the amputation I examined the detached leg and was ashamed to find such a large quantity of blood pouring from its vessels. I mentally resolved to save that blood in the future. An operation recurred to me of which I had, a few years before, assisted my predecessor, Stromeyer. It was a case of ligation of the brachial artery for aneurism, in which Stromeyer, in order to prevent the regurgitation of the blood from the capillaries, bandaged the arm from the fingers up to the aneurism before he applied the tourniquet above the tumor. At the time we discussed the interesting fact that the blood forced back from the capillaries into the arteries, possessed the color of venous blood, and we were surprised to find how easily the brachial artery was ligated after the blood that was still contained in the arm, had escaped through the incision.† It did not occur to either of us at the time, that the process was applicable to other operations as well; but now I acted upon this idea and have done so ever since in all amputations and exarticulations in which it was important to save the patient as much blood as possible. I have exhibited the method to many surgeons, both at the close and during the various wars during which I officiated as consulting surgeon. In 1870–71, too, during which I was engaged at the Berlin military hospitals, I advised all surgeons, who consulted me, to bandage the limb before amputating. In this way, with the aid of a compressorium aortæ, I have even exarticulated the thigh with comparatively little loss of blood. But the whole proceeding was still imperfect, partly because I carried my bandages only to the seat of disease, or at most, to the line of amputation, but mainly because the artery was controlled solely by digital compression. In all cases in which the patient was very anæmic, and in which it was of the utmost importance that he

*Conclusion of Art. XII.

†Strosmeyer's Maximen der Kriegsheilkunde, 2 Auflage, p. 164.

should lose as little blood as possible, I endeavored to operate as quickly as possible. Thus I have repeatedly performed the one—formerly the circular amputation, the most rapid of all methods, in this way: "All the soft parts were divided down to bone by a single sweep of the knife, then the bone was quickly sawed through in a line with this incision, and the vessels were ligated.

After the hemorrhage was thus arrested, I dissected up the periosteum as far as necessary to remove several inches more of the bone. In an exarticulation of the thigh I endeavored to reduce the loss of blood to a minimum, in the following manner: The anterior flap having been formed first, the crural vessels were ligated *en bloc*, then the muscles were divided by circular incision and the bone sawed through in line with the incision. Next the individual vessels were ligated and finally the upper end of the bone was dissected out and exarticulated. In another case I immediately reinjected the blood lost during the operation into the femoral vein after having deprived it of its fibrine.

In desperate cases all these methods fail and the loss of blood is always greater than the exhausted organism can bear. Our great object, therefore, was to find means of cutting off completely the circulation in the parts to be operated upon. Dieffenbach recommended a process for extirpating nævi involving the thickness of the cheek, by which the circulation is arrested until it becomes necessary to insert the sutures. He made use of a forceps, the blade of which terminated in oral rings, between which the tumor to be removed was compressed. Desmanes and Snellen invented compressing forceps for the removal of tumors about the eyelids which act in the same manner. They can be employed also in operations about the lips. In extirpating nævi, I myself make use of rings of horn or zinc, which are pressed down around the tumor by the assistant and generally cut off the supply of blood completely, particularly if there be any resistance as, for instance, about the cranial bones. I long since considered it a grateful task to seek a similar method for major operations.

The extensive use of caoutchouc in surgery, suggested the idea of utilizing its elasticity for our purpose. The results have more than realized our anticipations. After a few experiments had convinced us that the circulation could be completely interrupted by an ordinary rubber tube, our present method was rapidly developed.

A tube, such as we used to make counter-extension with in treating inflamed joints by extension, first served as a tourniquet; the rubber bandages used in treating dropsical effusions into the knee-joint, served as bandages for the limb. Every trial of the new method rendered its advantages more apparent. One improvement after the other was tested. The physical and physio-

logical conditions were determined experimentally by one of your fellow-students* and the more I became convinced of the advantages of this method, the more anxious I became to extend it to as many operations as possible.

Unfortunately its use is limited. We can completely control the circulation only in the extremities and in the external male organs of generation.

Possibly it may yet be extended to operations about the trunk, neck and head, by eliminating the circulation of one or all of the extremities, thus constituting them reserve depots, from which the general circulation could be replenished, in case the patient threatens to bleed to death. However, this is only an idea, the practicability of which is yet to be determined by careful experiments on animals and man.

Still I hope the new process may prove serviceable in many ways. In conclusion I must touch upon a point of the utmost importance in favoring the general adoption of the new method. Does it produce any after results detrimental to the health of the patient? Certainly we cannot deny the possibility that long continued ligation of a limb may lead to dangerous impairment of the circulation and innervation, viz.: thrombosis, inflammation, paralyses, etc., etc.

However, the manifold experience of surgeons of all times and countries in the use of the tourniquet and digital compression, renders it highly improbable that even a total arrest of the circulation can lead to evil consequences, provided it is not continued too long. The classic experiments of Colnheim have proved that the complete arrest of the circulation in warm-blooded animals does not cause any permanent disturbance, provided it is not continued for more than six or eight hours at a time. Having performed more than eighty operations according to this method during the last year, I can assure you that I have not seen an untoward event in a single case that could be ascribed to the process. I have performed operations that lasted more than an hour and have not found any disturbance of the circulation during the progress of the cases. On the contrary the results of the operations have been unusually favorable, and accidental traumatic diseases were exceptional.†

One precaution I wish to impress upon your minds: When you are operating upon parts infiltrated with pus you cannot render the part perfectly bloodless. If you compress the soft parts in such cases, you run the risk of forcing the infectious matter into

*Dr. Iversen: Die Kuenstliche Ischaemie bei Operationen. Diss. inaug. Kiel, 1873.

†In 329 operations performed from the beginning of the year to the end of the summer course (August 15), this method was used 87 times.

Of these 87 cases 21 were amputations and exarticulations (6 amputations of the thigh, 8 of the leg, 1 exarticulation of the arm); 8 resections, 13 cases of necrotomy, 5 extirpations of tumors: the rest were minor ope-

meshes of the cellular tissue above and into the lymphatics, and may thus do irreparable harm.

In such cases I do not apply the elastic bandages at all, but just before applying the compressing tube I elevate the extremity for a few moments.

ARTICLE XX.

THE EFFECT OF THE INHALATION OF COMPRESSED AND RAREFIED AIR ON THE PRESSURE OF THE BLOOD ON THE VESSELS. By PROF. S. VON BASCH, of Vienna. Translated for THE JOURNAL.

Einbrodt's[1] investigations tend to demonstrate that the arterial blood pressure increases during inspiration, and decreases during expiration. These facts were forced upon him during his investigations of the effects produced by the inhalation of compressed and rarefied air on the circulation of the blood.

Subjecting the thoracic cavity to a strong posative pressure, lessens the blood pressure on the veins during ordinary expiration, and by subjecting this cavity to a strong negative pressure increases the blood pressure on the veins during ordinary inspiration.

The occasion for farther investigation was caused by a question which had arisen, in the meantime, concerning the therapeutic effect of the inhalation of compressed and rarefied air. Waldenburg[2] has also discussed the inhalation of compressed and rarefied air on the circulation. This occured after the introduction of his portable pneumatic apparatus into practice, but his conclusions are directly opposed to those of Eindrodt's.

On the other hand, Drosdoff and Botschetschkaroff,[3] Gréhant[4] and Ducrocq,[5] after experimenting on dogs, certified to the same results as those maintained by Einbrodt.

From Ducrocq's experiments we learn this new fact, namely:

1. Ueber den Einfluss der Athembewegungen auf Herzschlag und Blutdruck. Sitzungsber. der Wiener k. Akad. d. Wissens XI. Bd. 1860.
2. Berliner klin. Worhenschs. 1873.
3. Centralblatt f. d. med. Wissench. 1875. Nr. 5. 45 u. 46.
4. Citirt nach.
5. Recherches experimentales sur l'action physiologique de la respiration d'air comprime. Paris, 1875.

rations, such as scooping out carious bones, scrofulous ulcers, opening abscesses, circumcision, etc.

Four of these 87 patients died. Most of the stumps after amputation united by first intention and without traumatic fever.

That during the inhalation of compressed air, the blood tension is increased in the right ventricle of the heart.

Sommerbrodt alone concurs with Waldenburg, *i. e.*, that the effects which were observed in the experiments on dogs could not be applied to that on men. This conclusion he arrived at from the indications of the pulse, as shown by the sphygmograph. These facts justified a new investigation of the subject.

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For the inhalation of compressed air, I have availed myself of Haucke's apparatus, which is admirably adapted for this purpose, and which is nearly similar to the apparatus used by Einbrodt, inasmuch as in the former instrument the compression of the air is brought about by pumping water into an air reservoir. The insertion of a manometer to control the pressure is thereby saved, as the position of the surface of the water furnishes sufficient information whether the maximum or minimum pressure is attained. The mouthpiece is made air tight on the face, by being cushioned. This is fastened to the patient by means of straps over the head and neck. Between this mouthpiece and the hose connecting it to the apparatus, is inserted a large faucet, so made that the communication with the apparatus and the outer air is alternately established. All these measures are essential, on account of the great importance of the quietude of the person experimented upon.

The effect of the entrance of the compressed air in the lungs, overcomes the elasticity and contractility of the parenchyma, which, according to Donder's, amounts to from 30–70 mm. water. It is well known that this pressure retards the filling of the large veins, especially the vena cava descendens. This effect, according to Einbrodt, is evident in the swelling of the veins of the head, neck and arms.

Einbrodt demonstrated that during the beginning of the breathing of the compressed air, the compression of the heart, and of the blood vessels inclosed in the thoracic cavity tended to hasten the outflowing blood and to heighten the arterial pressure.

These phenomena refer to experiments made on subjects which remained passive in their respiration, that is, did not make forced or violent inspirations. * * * * *

The effect of the inhalation of rarefied air in the case of dogs that have been narcotized with opium, is strong dyspnœa, and the respiratory movements have a dyspnotic character. Besides this, on account of the relative heavy pressure on the external surface of the thorax, the inspiration movements are carried on with great difficulty; the exertion seeming to require their utmost strength. During such respiration the arterial blood pressure is increased. This increase is preceded by a decrease of the pressure for a very short duration. All of these experiments are made manifest by the increased volume of the arm on the

inspiration of compressed air, and which is decreased on the inspiration of rarefied air. If the persons experimented on should, in spite of the unpleasant feeling of dyspnœa, abruptly suppress their respiration, or only carry it on with but little exertion, the relations of the volume of the arm would be reversed.

The figure of the pulse-markings, which I took with a Fick's manometer, changed, as could be expected by volumetric conditions, during the inhalation of rarefied air, but not according to Waldenburg's assertions. * * * * *

Proceedings of Medical Societies.

ST. LOUIS MEDICAL SOCIETY. JAS. M. SCOTT, M. D., President.

R. M. FUNKHOUSER, M. D., Stenographic Reporter.

[Revised by the Committee on Debates for THE JOURNAL.]

MEDICAL SOCIETY HALL,
POLYTECHNIC BUILDING,
ST. LOUIS, December 8, 1877.

Dr. S. T. Newman's Essay on Pneumonia and its Treatment.

MR. PRESIDENT:

The desultory discussion on pleurisy and pneumonia at our last meeting, growing out of a case of pleura pneumonia reported, seems to indicate a very unsettled state of the professional mind in regard to the treatment of these affections, and reminds me of a statement made by Aitken, in his recent work on practice, viz: "One of the most discordant topics in the science of medicine (with some) is the treatment of pneumonia." And although within the last few years the subject has engaged the attention of some of the most distinguished members of the profession, who have written much that is highly instructive, yet we have either failed to comprehend the principles of treatment attempted to be formulated, or we must conclude that the best plan of treatment is yet *sub judice*. It may not, therefore, be out of place to refer briefly to the more recent views inculcated upon the subject, and to examine the *principles* upon which these views are predicated.

Within the last quarter of a century there has been quite a revolution in regard to the treatment of all inflammatory dis-

eases. The view enunciated by Todd and Bennett, that disease is to be gotten rid of through the nutritive process, and that the object of treatment is to assist the powers of nature, was certainly a step in the right direction. But how far the means which they employed for this purpose are to be received and endorsed, is another question, and admits of discussion.

In the discussion of this subject, the correlation of very many conditions is to be considered. First, as to whether the nutritive functions together with the vital powers of the system are depressed, or whether in an exalted condition—hypergeneses of function. Secondly, the local condition of the digestive apparatus must be well considered. Thirdly, whether there be nervous depression or exaltation—neurosthenia. Fourthly, the general and local wants of the system must be understood, so that injesta looking to these ends may be supplied, as earth for the bones, phosphorous for the brain and nervous system, nitrogenous compounds for tissue building, hydro-carbons for burning and other purposes. Fifthly, we must have a proper understanding, both of the physiological and therapeutical action of the remedies we propose to employ, in order that we may not controvene in the one direction or the other. The discussion of these various and interesting subjects, is not here contemplated. I design simply to continue the discussion of the subject which engaged our attention at our last meeting, viz: pleura pneumonia.

The pathological conditions, existing in pleurisy and pneumonia, are well understood, which afford great assistance in arriving at logical inferences as to treatment. Inflammation of the lungs may be single or double, or it may involve a part of one lobe, and is then called circumscribed. It may be complicated or uncomplicated. It has been divided into three stages, each stage being characterized by its peculiar anatomical changes.

The disease is usually ushered in with a chill or rigors, headache, cough, pyrexia, pain in chest, the intensity of which depends upon the extent of pleuritic complication. In this stage —first—there is hyperæmia of lung substance, and hence it is called the stage of ingorgement—stasis, with some effusion into areola tissue. These conditions are expressive of a pathological state. In this stage, physical signs are, slight dullness on percussion, though there is still more or less resonance and crepitus. This last is not always present, the reason being well understood; but when present it is diagnostic. This peculiar sound is thought by Androl, Watson and others, to be produced by the bursting of air bubbles in the presence of some fluid. Flint believes it is caused by the air cells, the walls of which being swollen, are brought in contact and partially agglutinated, and when forced open by air, give rise to a crackling sound such as might be produced in an exaggerated degree by separating two smooth surfaces, agglutinated by soft butter. Following closely upon these physical signs arises a symptom of great diagnostic importance. I

allude to the rusty colored sputa, which also is characteristic, and is readily distinguishable from the bloody sputa of bronchitis. In the latter the sputa is "thin at first and streaked with blood, becoming after a while glairy, and of a faint greenish or yellow color," while in pneumonia it is viscid and of a rusty color, being well mixed with blood resembling the admixture of mucus with brick dust. "In this stage the lung still contains air, and crepitates when handled, and if cut, exudes bloody serum mixed with air." Following these conditions come other changes. The engorged condition is succeeded by the rapid effusion into lung substance of lymph, which becomes organized, causing complete consolidation, so that air is no longer present in the diseased part, which becomes greatly increased in weight, and is said to be hepatized, and is also called red hepatization. These conditions constitute the second stage. It is well to remember that the great increased weight of lung is not owing to an accumulation of blood—there being present indeed, much less than normal—but to the withdrawal from the system of solid matter which gives rise to great depression.

The stage which follows this is the suppurative stage, in which pus is infiltrated into the parenchymatous portion of lung, and constitutes gray hepatization. The lung becomes soft and friable. Two other stages or events may sometimes follow. I allude to abscess and grangrene. I have known one case of each.

Diagnosis.—Pneumonia is easily distinguished from pleurisy by the severity of pain, and by the rubbing sound in the latter, and by the presence of crepitus and the rusty sputa of the former. From bronchitis it is distinguished by the character of the sputa, to which we have already referred, and also by the physical signs characteristic of each. It is distinguished from phthisis by the suddeness of attack, and by the presence of crepitus, differing from the louder and dry crepitus sometimes found in phthisis.

Prognosis depends on many accompanying circumstances, such as extent, complications, age and constitutional vigor. Single, uncomplicated pneumonia, in vigorous constitutions, nearly always results in recovery. In the aged, and in those predisposed to phthisis, it is always a dangerous disease, while double pneumonia is dangerous at all periods of life.

Treatment.—There is no specific treatment for pneumonia, each case must be treated according to indications. It cannot be aborted. Most writers agree on this subject, except in the *very beginning*.

The experiments made twenty-five years ago by Todd and Bennett, mostly in hospital practice, have, I am convinced, misled, *to some extent*, the profession. These justly distinguished observers, ascertained that a large proportion of cases of pneumonia, treated upon the nutritive and stimulating plan, recovered

The fact that most of these cases were from among the poor and illy fed, and in constitutions enfeebled by these and other causes, was perhaps not duly considered.

The views put forth by these gentlemen rapidly spread over two continents. Their plan of treatment, indeed, became extremely *fashionable* and was rather indiscriminately adopted, and while I doubt not it has, under some circumstances, saved many lives, its indiscriminate use has destroyed many more, and has filled the *land* with *drunkards*. This treatment is doubtless well adapted to many cases, but when applied to the young and vigorous, living in healthy districts, it has been found unsatisfactory, except in the advanced stages, and now, to use an expression of Dr. N. S. Davis, the pendulum which had swung so far beyond the perpendicular, has began to return, and the treatment of disease upon the principles of Niemeyer, Straube, Richardson, Aitken, Flint, Watson, Fothergill, Park, etc., are regarded as more rational. Nevertheless, I would not be understood saying that the nutritive and stimulating plan of treating pneumonia, has been without good results. On the contrary, it has given emphasis to the important principle, that conditions must at all times be considered in the treatment of diseases. In the one case, we may deplete, and in another we may stimulate without let or hindrance. As inflammation of the respiratory organs responds readily to bleeding, and, as under a *few circumstances*, bleeding is imperatively demanded in order to save from impending death, let us consider under what circumstances it is proper in pneumonia. On this subject both Watson and Aitken say that there are cases in which life can only be saved by general bleeding. "In some cases where œdema supervenes in a part of lung not involved in pneumonia, a farther transfusion of serum into the air vessels is prevented by bleeding." "When pneumonia attacks a person in vigorous health and of good constitution, when the temperature is 105° and the pulse over 120, and strong, bleeding will reduce the pulse, lower temperature and lessen danger from violence of fever." Watson says, when the veins of neck are turgid, and the right heart distended with blood so as to embarrass its action, by bleeding you may save your patient. Similar views are held by Niemeyer, Flint and Fothergill, while all concur in the opinion that in the old and enfeebled it is contra indicated, and may do great mischief. What has been denominated *modern bleeding* (hot poultices and fomentations) is always of service.—Fothergill.

The remedies which are thought to be most useful in the treatment of pneumonia are calomel, aconite, digitalis, veratrum viride, opium, antimony, quinine, gelseminum, ammonia, alcohol, expectorants. In entering upon the treatment of pneumonia, Watson says he would *for once* administer a mercurial purge. If the pulse is frequent and strong, temperature high, give digitalis, with aconite, or veratrum viride. As the physiological effect of

these sedatives is somewhat different, the one or the other may be selected, or they may be combined, according to circumstances. Digitalis lessens the frequency of the pulse, while it increases its power. Aconite lessens both power and frequency. Both lower temperature. Veratrum viride lessens frequency and power, and may induce symptoms, similar to collapse. Its sedative effect is obtained quicker than that of digitalis. Hence when the inflammation runs high and we desire to make an immediate impression without bleeding, the veratrum viride will better meet our purpose. But under ordinary circumstances Fothergill, Flint and Aitken regard aconite and digitalis as safer and therefore preferable. These remedies *must* be given *until the desired* effects are produced, and may be continued for days, and in dilatation of heart digitalis has been given for months with the best results. Both digitalis and aconite aid the eliminating powers of skin and kidneys. Straube gives digitalis in doses of from x to 1 gtts. every three or four hours. An intermitting pulse suggests its discontinuance at once. Tinct. aconite rad. may be given with digitalis. When given alone the dose may be from iii to v gtts. Ringer and Fothergill suggest it to be given in small and frequently repeated doses from ss. to i gtt. every ten minutes until an impression is made. Opium is also a very important remedy in pneumonia. Flint says he has frequently known it to lesson frequency of respiration and pulse, causing decided comfort, followed by refreshing sleep. And when pneumonia is complicated with pleurisy, which is often the case, it must be given freely. "Here we no longer have two smooth surfaces gliding over each other, but dry and vascular surfaces, whose friction gives rise to exquisite pain." Is *there a gentleman in this house* who *under such circumstances* would withhold the use of opium, aye, the hypodermic syringe. Where cough, pain and want of sleep are present, it is proper in all stages of pneumonia, but may be guarded by antimony or ipecac. Impairment of lung function, and cyanosis from any cause contra-indicates its use.

Flint says a great change has taken place within the last few years in the medical mind in regard to the use of opium in the treatment of inflammations. Bartholow in his work on Materia Medica, just out, suggests gelseminum as a valuable auxiliary for cough, dyspnœa and fever. It lessens respiration, obtunds nervous sensibility, and acts on the sympathetic nerve, and is recommended by Bartholow in pneumonia and pleurisy. As a cough mixture, where opium cannot be taken, I have derived signal benefit from the following:

℞. Syrup Hyperposphites.....℥ss.
Syrup Ipecac.....ss.
Tinct. Gelseminum.....ii.
Fl. Ext. Hyoscyamus.....℥ i.

M. Dose, a teaspoonfull two or three times a day.

Quinine under certain circumstances is an important remedy

in pneumonia, and *especially* so, when the system begins to flag. The patient must be nourished from the first. For this purpose nothing is equal to good milk, and for the stage of depression, beef tea, which is a grateful stimulant, but according to Fothergill, very deficient in nutritive properties.

In regard to the use of expectorants, there is some difference of opinion. It was for a time the custom to give for this purpose ipecac, antimony, etc.; in more advanced stages carb. ammonia, muriate ammonia, senega and squills. I regard these remedies as often productive of good. Fothergill lays down a rule for the use of stimulating expectorants. He says where, in pneumonia and bronchitis, the skin is moist and the phlegm loose and free, then give carb. ammonia, senega, squills and benzoine, but when an opposite condition exists they will do no good and may do harm. Flint says, "remedies given to promote expectoration were given under a misapprehension as to how the lung is to be relieved of the mass of solid matter which it contains. It was thought that this exudation was thrown off by expectoration, when in fact it is taken up by absorption, which may go on rapidly without expectoration, and mucus products rarely accumulate in bronchitis except from exhaustion, when stimulants, tonics and support must be *pressed*. The danger is not from solidification, but from exhaustion of vital power before resolution takes place."

As in this stage the use of stimulants and tonics is eminently called for, we will now proceed to inquire how, and under what circumstances they may be given to secure their greatest efficiency.

In order to determine the circumstances under which the use of tonics and stimulants are indicated, we must first bear *carefully* in mind the condition of the patient, and secondly we should understand the effects of our remedies in health and disease. In the disease which we are now considering, presuming the condition of our patient to be understood, let us at once proceed to look into the effects of tonics and stimulants, taking quinine to represent the one, and alcohol the other. The effect of quinine upon the system depends upon the quantity given. In large doses it is a sedative, lowering the temperature and greatly reducing the frequency of pulse. A very large dose (℥ iii), has been known to produce entire insensibility and great prostration. While in large doses its action is principally upon the cerebral centers, it also causes gastric and intestinal irritation. When given in lethal doses it does not causes death *per se*, but by cooperating with disease in intensifying inflammations before existing. In small, repeated doses, it possesses decided tonic properties. From the effects of quinine just detailed, its therapeutical action is well understood. In administering it, therefore, for its tonic effects, (*especially in low* forms of pneumonia), and other diseases, it should be given in small doses, frequently repeated, so

as to keep up its effect—one or two grains every two or three hours. Where disease is complicated with a malarial condition the dose must be larger. I have never been an advocate for large doses of quinine except in septicæmia, pyæmia, etc. In these diseases I believe it is equal to any remedy with which we are acquainted. Here, large doses repeated several times a day may be given. In these cases the medicine seems to be expended in neutralizing the poison in the blood, and not upon the brain.

As to whether alcohol possesses nutritive as well as stimulating properties, is not fully settled, though I believe the weight of authority is in favor of its nutritious qualities. Of its prompt and active stimulating properties in small quantities there can be no doubt, and where there is depression of vital power from any cause, we may invoke its use.

I had intended fully to consider the indications for the use of alcohol, but as I have been led too largely into the discussion of some other points than those intended, I will only briefly epitomize the views of Park upon the subject, who has given it an extended examination. His views, to which I have heard Dr. Montgomery allude in this Society, may be fully understood by a single illustration which he gives. He says that, where a fresh steed, in good condition, is striving for a distant goal, if when he starts out, we begin vigorously to apply the whip and spur, he will fall exhausted ere he reaches the goal; but if we allow him to proceed until near the goal, when his powers begin to flag, and then apply whip and spur, he may be expected to arrive in safety at the end of his journey. Just so it is with disease. The vital powers yet strong, are struggling for the mastery. If in this condition we begin to apply *whip and spur*, we overtax nature, and our patient may sink; but if we wait until vital depression begins and then use stimulants, we will assist in tiding over the critical period.

It only remains now, Mr. President, for me to say a few words in regard to a complication, revealed after death, in the case of pleura pneumonia formerly reported, a condition to which Bennett and Flint both refer, viz: Thrombosis or heart clot. Flint says the immediate cause of death from pneumonia is often from thrombosis, and if post mortems were more frequent he thinks it would be sometimes found where not expected. The symptoms which under some circumstances would suggests its presence, may in pneumonia be referred to the lungs, and not to the heart.

The conditions which favor coagulation of blood, and thereby heart clots, are phlebitis, inflammation, over distention of cavities of the heart, slowness and want of vigor of action; local conditions, as stenosis, inequality of surface in arteries and veins, increased fibrinous condition of blood, etc.

As in all inflammations the fibrination of the blood is increased, it must be regarded as a predisposing cause of thrombosis. In the case reported at our last meeting, what other

causes may have assisted, we may not ascertain; but it is at least supposable that the extreme consolidated condition of the left lung may so have prevented the pulmonary artery from emptying itself, as to explain the whole matter.

But as it has been suggested that the remedies employed may have had an influence in producing the heart clot, let us analyze this matter. Now if there is any truth in this suggestion, the influence of these remedies must have been mechanical or chemical; that is, they must have so acted upon the heart or vascular system as to embarrass function, or they must have exerted some chemical influence upon the blood itself. In order to properly present this subject, let us epitomize the treatment. First, ¼ gr. morphia to allay distressing pain; hot poultices from first to last; one single mercurial purgative to relieve constipation; sedative mixture to counteract great arterial excitement and reduce fever, viz: Tinct. digitalis, tinct. gelseminum, each ten drops, tinct. aconite, one drop every two or three hours; quinine, iii gr. doses every three hours, from beginning, because of malarial complication, patient having had two chills. Second day, *whisky*, and continued throughout; ten drops Battey's sedative at night to relieve pain and induce sleep, patient not having slept the previous night; twenty grs. chloral and thirty grs. bromide potass. having signally failed. Fourth day, carb. ammonia to supplement whisky. Same day, ipecac and hyoscyamus to relieve cough.

This constituted the treatment. If any of these remedies could be supposed to favor thrombosis, it would be those which reduce the power of the heart, and retard the circulation. Now what are the facts just here: First, the frequency of the pulse was never reduced below 100, and Dr. Prewitt tells you that its volume was good almost to the last. Can a pulse of 100, and of good volume, indicate that heart sedatives had been unwarrantly pressed?

Next, let us inquire what remedies have an influence in preventing thrombosis. From the physiological action of digitalis, established by Fuller, and more recently by Bartholow, viz.: That it gives tone and strength to the heart, and enables it fully to empty its cavities, it would very naturally be suggested as a valuable remedy for this purpose, and for this *very object* Flint recommends it above all others, and yet it was the principle sedative given in the case referred to by Dr. Prewitt and myself. Another remedy used was ammonia, which is supposed to contribute to maintaining a liquid condition of the blood, and which Richardson has extolled as a remedy against embolism.

Discussion Upon Dr. Newman's Essay on Pneumonia.

Dr. Wm. Porter:—I am sorry that what was said last Saturday evening, in reference to the teatment of pneumonia, has been thought to have had a personal direction. But if in remarking

upon the case reported, I said anything that might be so interpreted, I apologize. We all concede the statements regarding the main features of pneumonia, in the excellent paper just read (Dr. Newman's), but I propose to offer some thoughts as to treatment. There is one condition that is present in nearly every case, and that is increased heart effort. In all forms of pneumonia, but especially in the acute sthenic, or croupous, and in every stage there is resistance in the lung to the action of the right heart. Throughout the whole course of the disease, either in engorgement, hepatization or purulent infiltration, the heart labors to send blood through an organ already containing too much blood, or blood-products, and through this organ the blood must go or else be dammed back in the venous system. This is the first cause of heart failure in pneumonia. Again, the surface in which the air meets the blood in the lung is diminished, but enough of blood must be sent to the parts of the lung yet free to accomplish changes that formerly took place through the agency of the entire lung—a second cause of heart failure. In the third place, the heart often is directly affected by the febrile condition. I have not time to go into the pathology or symptomotology, by which additional reasons could be given for supporting the heart's action in pneumonia, but the best authorities, as well as reason and experience, tell us that in all cases of pneumonia the burden of effort falls upon the heart.

Regarding treatment, I will confine myself to the statement that heart-depressents are not indicated in pneumonia, but that stimulants, in most of cases, should be used. Other remedies have their places, ergot in the earlier stages, quinine, the cold bath, counter irritations, etc., but heart depressents, nevertheless, may be used in exceptional cases, at the very incipiency. Furgenson says, all measures that weaken the heart must be excluded from the treatment of pneumonia. We must guard against both existing and apprehended exhaustion, and one is as important as the other. In almost every instance in this disease a quick pulse calls for alcohol, and the stronger and more rapid the heart action, the greater the need of stimulants. for it is well proven that alcohol lowers the pulse in direct proportion to the amount given, thus giving us the beneficial effect of veratrum and aconite, while we avoid ruinous depressing results. It reduces the temperature, also, first, by retarding the destructive metamorphosis; second, by its effect upon the heart directly; and third, by tending to restore the ratio between the pulse and respiration. Alcohol may always be given where there is a loss of heart power—where there is danger of the vitality being used up. I believe that pneumonia is a specific fever running a specific and well determined course, and that if we can bridge over the danger of exhaustion and support nature, we can save our patients. Not in every case would I use alcohol, nor in any case use alcohol alone, but in most, especially in the old, and wherever

the disease threatens exhaustion, the patient must be supported and it is good practice to stimulate.

Dr. Hughes:—I was so unfortunate last Saturday evening as to remark that it did not seem to me an improper course to use sedatives in the treatment of pneumonia in combination with a tonic plan, which remark has involved me in this discussion. Let us leave aside theory and come to practical facts. We find an engorgement of the lung, an increase of the heart's action, an abnormal rapidity of the pulse, and now, as physicians, we are accustomed to reason, what are the indications for treatment? An abnormal action of the heart to be corrected as soon as possible. There does not appear to me any objection to medicines that will produce a tonic action, while there is an objection to the use of stimulants to goad on the overlabored organ to increased action, but that the indication is to employ remedies which will restrain the heart to within its normal limit, and add to the support of the system. I think there is no objection to a tonic course; and in speaking of tonics I do not mean *two or three grains of quinine, but eight grains every four hours.* Nor do I see any incompatibility between veratrum viride to control the heart's action and a tonic to assist in expelling its contents. When I began the practice of medicine in 1855, Todd and Bennett made then a report on the use of alcohol in disease, and elicited at that time much attention. It did not strike me then, though the result appeared to be sustained, that the goading treatment was proper for sthenic forms of pneumonia, and from subsequent experience in the hospital, and in private practice especially, I have never found any other treatment better than quinine, and sustaining nutrition, and controlling the heart's action. It don't seem to me right to stimulate the increased action of the heart, but rather to give remedies which are not stimulant, but will aid and control the disabled organ. In contradistinction to the English plan, you may adopt the American and give veratrum viride, and you will be equally successful, if combined with the use of quinine. Then the rational plan of treatment of the disease is sustaining—nourishing the system. This is not a disease of increased nutrition. All the objection that obtains against veratrum viride is its irritation of the stomach, which it frequently produces. It may seem singular, but in my experience of five or six years at Fulton, I can recall scarcely a patient who died from pneumonia. It is true that when the patients were afflicted, they came under immediate observation, and were treated in the incipiency of the disease. It never occurred to me, an indication in sthenic or asthenic cases to resort to stimulants, but to support and strengthen the patient with quinine and nutrition, and to use sedatives to restrain the heart's action. It is rational to treat it so either in the sthenic or asthenic forms.

Dr. Bryson:—I notice in the report of the case one idea

prominent—that slowing of the heart's action assisted in the formation of heart clot; that it tended to cause the coagulation of the blood. In the light of our present physiological and pathological knowledge, I don't see how that can be said. Outside of the body, motion increases the tendency to coagulation of the blood; we whip the blood with rods to cause coagulation. After death, when motion has ceased, the blood frequently remains fluid, in the large vessels, for many hours. Suppose the clot found in this case was *ante-mortem* clot, how can it be said that it was caused by slowing the heart's action? The normal beat of the heart is 72 per minute. In this case we are told the pulse was never below 100. Slowing the heart-beat does not tend to cause coagulation of the blood. Neither does non-oxygenation increase the tendency to coagulation, nor does exposure to the air (for the blood is exposed to the air in the lungs); nor does removal from the air increase or prevent it (blood drawn under mercury coagulates the same as when drawn in the open air). To say that the clot was caused by the heart's slowing will not hold good. But there was a heart clot, whether ante or post-mortem; the fibrin-factors united to form the clot. What caused them to so unite? A diseased condition of the lining membrane of the heart will cause heart clot. There is a relation, in the physiological condition, between the blood and the lining membrane of the heart and vessels, that prevents the formation of a clot; prevents the union of the fibrin-factors. Inflammation of this membrane increases the tendency to the heart clot. Why may not this have been the case in this instance? If the heart is overworked, why may it not cause inflammation of the endocardium? Why not cause clotting of the blood! There are more reasons why inflammation would be set up. We know we have valvular complications and there is danger of clot forming in that way. There is another thing. It seems to me there is a vast difference to be expected in the results of the treatment of a patient with pneumonia who has been previously ill fed, and been living in filth, and who has then been brought into a hospital where he gets good food, etc., and one who has previously lived well and still continued debilitated. Perhaps I can illustrate this better by mentioning what I read in the *Lancet*, of cases of chorea, which were cured without any medicines whatever. These cases were taken from the lower classes and had been badly fed, and were placed in the hospital and well fed and cared for. This change from foul air and poor food, to fresh air and good food, was, itself, strong and efficient treatment. No such aid could be brought to bear in this case, for the patient had always lived well, and yet remained feeble. I don't know how the use of calomel, or any mercurial, would act favorably in a case of this kind, unless given in small doses. Dr. Keyes, of New York, says, in small doses it acts as a tonic, and he gives good reasons for saying so. Examining the blood

under the microscope, he found the red blood corpuscles increased whilst mercury was being taken in small doses. I think there are good reasons for avoiding calomel as a purgative in these cases, where debility is a marked feature. Calomel acts on the small intestine. Here the digestive juices are actively at work. When a calomel purge is given, the products of digestion and the bile are swept out of the canal, and no time is given for absorption. The liver is thought, not only to make new bile—which is a digestive fluid—but to secrete again old bile; so the use of this mercurial as a purgative, will actually decrease the store of one, at least, of the digestive agents.

Dr. Montgomery :—I did not expect to say anything. I was unaware that treatment of pneumonia was the subject of discussion for to-night. I have only a few remaks to make. Before going on, I regret Dr. Newman's reference to the criticism, especially as it was done in a gentlemanly way. We must expect the cases to be discussed. It is better that we do not all agree. We should bear with criticism if it is made in a gentlemanly manner. That was the only thing that I noticed as being objectionable in the paper.

What we observe in pneumonia, is, first, hyperæmia, tendency to blood conjestion, red hepatization and gray hepatization, and purulent infiltration. In the first stage, there is a chill and general malaise, quick pulse and increase of temperature. We must guard against the hyperæmia and endeavor to control the circulation. I am in the habit of giving pills composed as follows:

R. Morphia.....Gr. i.
Ipecac.....Gr. x.
Calomel.....Gr. v.

Make into pills No. 8. One or two pills to be given every three hours, according to the condition and idiosyncrasy of the patient.

This treatment generally answers most admirably; the skin becoming moist and the breathing easy. If the patient be neither too young nor too old, I bleed a little from the arm or use cups or leeches. The result from taking a little blood, if the pulse be quick, the pyrexia great, and respiration labored, is very beneficial. I have great confidence in veratrum viride, also, although many are afraid to use it. I know that alarming symptoms are sometimes produced by the veratrum being given too frequently, but no matter how low the pulse may be brought by the use of it, if we leave off the medicine and give some paregoric and brandy, the patient will get all right again. It lowers the pulse, eases the respiration, and brings down the temperature. In the more advanced stages we can only strive to support the patient, and keep up his strength, so that he can get over the effects of the disease, and we can best do this by giving him carbonate of ammonia, brandy and beef tea, and other suitable nourishment. I have been struck with the reports of a great many cases in the

last half year, taken from the English hospitals, where the acetate of ammonia was almost the only medicine given, and from the description of the cases, many of them were very severe. Warm jacket poultices are admirable adjuvants. There is one thing my philosophy was never able to explain, that is, how warm and cold applications will accomplish the same thing. I don't know how both do good, but I believe that cold will do more good than hot applications. Years ago I visited New York, and Dr. Thomas was kind enough to take me to Bellevue Hospital to examine the cases of pneumonia. No case had any other treatment than hot poultices, combined with the administration of spirits of nitre, wine of ipecac and liquor ammonia, and acetatis.

DR. PREWITT :—I do not rise to apologize for the treatment of the case reported by Dr. Newman; it don't need any. I perfectly agree with Dr. Wm. Porter that pneumonia is a specific disease with a definite course, and has stages as other diseases. I have held this position for years. If it be correct, do we, can we hope, by medication adopted by any school, to cut short pneumonia? I don't believe it; but on the contrary, in spite of medicines, it will run its course. Take the patient at the outset, before the disease has become localized and before fever has set in, and by the abstraction of blood and the use of morphine and quinine, there may be a possibility of cutting it short. But when engorgement is established, can we prevent hepatization? If we cannot, what good, after it has taken place, can be accomplished by active remedies? It will run its course when hepatization takes place and the patient goes on to convalescence, or the lung breaks down. Consequently, a multiplicity of medicines is all wrong. From time immemorial blood has been taken and mercurials given. In other words, the tendency has been to individualize the disease and to generalize the patient, which was the opposite to what it should have been. Reverse it and it would be the proper order of things. But the treatment which is the most successful, is simple support, practically doing nothing in medicine. All in all it is the most successful treatment, and the best, but is not adapted to every case. We should not generalize the patient, but individualize the patient and generalize the disease.

DR. PORTER :—In a case of pneumonia the heart's action must be increased to force the blood through the lungs. Is this not so in all inflammations? Why is this so in pneumonia rather than in inflammation of the liver or brain? In all fevers, there is increase of the heart's action, not diminished but increased, and with greater force at that, and the patient does not need stimulants or whisky, and what I contend for is that the patient does

not need whisky at the beginning, but we should sustain him by proper nutrition and not stimulants.

Dr. Chas. H. Hughes' Essay on Pneumonia. Read Dec. 15, 1877.

The discussion of this subject at the two preceding meetings, verifies the statement of a distinguished author that "one of the most discordant topics in the science of medicine seems to be the treatment of pneumonia."

Within a half century the pendulum of professional opinion has swung from the extreme of excessive venesection to that of over-stimulation. The reaction of Laënnec and Louis, against indiscriminately breaking the organic structure by withdrawing the materials of its reconstruction through the supporting columns of the circulation, was followed in certain quarters by the alcoholic insanity of Todd and Bennett. A theoretical delusion based upon the illusory, undemonstrated and undemonstrable view, that because in nearly all cases there exists more or less of oppression and prostration, therefore they are all or nearly all so similarly asthenic in character as to require that kind of stimulation, mainly to be found in alcohol and that sort of nutrition, which exists *par excellence* in the opinion of some, but in one view, sparingly if at all in uncombined alcohol, that is, in alcohol when not administered in the form of wine, malt liquors, whiskies, brandies, etc.

The crippled and laboring lung and over-acting heart, say the alcohol theorists, require to be stimulated. They liken the rapidly beating heart especially to an over-burdened horse, making little progress but very great effort to get up-hill, because of the obstructions in his way, which they would remove—the whip and spur, and oats of alcohol.

It seems never to have occurred to these therapeutic logicians, that lightening the load of the jaded animal and conserving his strength, by timely rest and restraint put upon inordinate and futile effort, made at the expense of that latent power upon which the animal's remaining and containing vitality depends, might both save the horse and transport in due time his burden.

Medical theories are often attempts at generalization of morbid states and therapeutic conclusions drawn from them, are frequently misleading in special cases. In fact, for clinical purposes are generally safest.

Theories are the short route flight, which genius makes, rising above rather than overcoming obstacles. The practical physician at the bedside must remove, and not evade disagreeable morbid obstructions which lie in the way of his patient's recovery.

As a theory the law of *similia* has been tried, and though still in vogue with a large body of theoretical practitioners, as the therapeutic law governing other cases than those wherein the heart is initiated to over-action by morbid excitation, has

been found in the light of the general practical observation of the profession, wanting in supporting facts.

In the treatment of pneumonia there are many facts to be considered.

Though closest theorists may ignore them they cannot thus be abolished. It has its variable and varying stages and varieties—age, season, climate, epidemic, endemic influences, and accompanying constitutional cachexias modify its manifestations. Extent of lung tissue involved, the stage at which treatment is begun, as well as the nutrition of the patient preceding, and his surroundings during the attack, so that it cannot be treated as a never varying condition. The tenants of poverty's abodes, in the back-streets and alleys of our crowded cities, who come under treatment at dispensaries and charity hospitals, present not all the same features as the well nourished citizen stricken in the midst of active business, owing to some sudden disturbance in the equilibrium of the circulation, determining a localized inflammation.

Some depression of system from business worry and perhaps deprivation of sleep, often precedes the coming on of these latter cases, but there is seldom mal nutrition and assimilation to any great extent.

Pneumonia with hepatitis, phthisis, typhoid fever, and typhoid states, are not precisely the same as the pneumonitis of trumatism or suppressed perspiration. Yet hospital reports put them forth to sustain a theory, and mass all these dissimilar forms together, as so many illustrative cases, and when the majority recover, as they would under proper hygienic conditions and nursing alone, the advocates of the alcohol plan are exultant in one hospital and those of the expectant are equally elated in another.

One well marked case of double sthenic pneumonia with congestion in every part of both lungs, with a temperature reaching 106°, falling to 100° under ten grain doses of quinine every six hours, with forty or more respirations and a pulse of one hundred and thirty beats per minute, falling under six-drop doses of veratrum viride every four hours, to twenty respirations and a pulse of seventy-five or eighty, is worth more to me than scores of cases recorded without a minute statement of temperature, pulse, respirations, extent of pulmonic surface involved, etc.

I have seen more than one such case, and they are the cases which, without controlling, generally die.

Twenty years ago, before so much attention was paid to temperature in disease as now, and before it was generally conceded that quinine would lower the body heat, I saw such a case conducted to a safe and rapid recovery in veratrum viride alone. The veratrum treatment then made upon me a profoundly favorable impression which has not been effaced by an extensive subsequent experience.

Veratrum viride timely and freely given in the congestive

stage, with quinine and Dover's powder, have, in my hands, many times cut short the progress of pneumonia in its congestive stage. I have tried it in the field, in the hospital and in civil practice.

A large number of cases falling under observation in charity hospitals have generally reached the stage of commencing hepatization in some part of the lung before the patient's admission. I would not expect much from attempts at aborting the disease there.

When hepatization is somewhat advanced or the suppuration stage has been reached, I am willing to compromise with the alcohol advocates on the champaigne *pro re rata*.

In the practical management of this disease it is not a never varying something which we term pneumonia, that we are to manage, but if the temperature, the pulse, the respiration, the pain and pulmonic oppression, together with the assault the disease is making on the vital stamina of the patient, that are to be regarded, and these are to be considered according to their varying intensity in all forms and all stages of the disease.

There are some extremely asthenic cases where stimulant quantities of alcohol may do good. There are others where it does little harm, and others which, in spite of the harm it does, recover; and there comes a stage of hepatization and suppuration in many cases when to withhold milk punch or eggnog would be homicidal. But after all, it is the pulse, the temperature, the respiration, the nutrition, the pangs, the cough and the nervous shock that are to be controlled and regulated. The remedies which best regulate them are well known, and alcohol for that stage and kind of pneumonia when we might not trust the disease to nature and nursing, is not the remedy.

The value of cups and poultices for the first stage, and of blisters for advanced second stage, of suitable expectorants and the benefit of a mercurial cathartic in the beginning are conceded. In my army experience, I am confident that I have averted many a pleuro-pneumonia by a brisk cathartic and quinine in full doses during the day and fifteen or twenty grains of Dover's powder at night, and I may say the same of copious hot whisky punch given, when on the march, in lieu of the Dover's powder.

But when a typical sthhenic pneumonia is fully established with a pulse above 120, and forty respirations per minute and a temperature of 104° or 106°, who would think of alcohol then as the best remedy?

If such cases recover under alcohol, it must be in spite of it.

I like not the simile of the tired horse, needing only alcoholic whip and spur applied to the excited organism.

The fault is not in the struggling nag—the heart, but in the driver—the excited cardiac and vaso-motor nerve centres responding abnormally to immediate and reflex irritation.

Let us sooth, restrain and retard the animal, rather than goad him to increased exertion beyond his strength.

Gelseminum and digitalis have answered well sometimes in my hands, when the stomach has been irritable.

I could not well dispense with opium, the valerianates, camphor, and the bromides, for their anodyne and hypnotic properties as adjuncts to the sheet anchors, veratrum viride, quinine and nutrients.

I have found use also for Hoffmanns' anodyne, spts. mendereri and nitre, the tinct. of gelseminum acting admirably with the two latter. Belladonna, hyoscyamus, and the fluid extract of wild cherry have a minor place in my therapeutic armamentariam.

I have discarded chloral as an unsafe hypnotic, especially in the second and third stages of pneumonia.

THE TWELFTH QUARTERLY MEETING OF THE DISTRICT MEDICAL ASSOCIATION OF NORTHWEST MISSOURI. W. I. HEDDENS, President.

The District Medical Association of Northwest Missouri held its twelfth quarterly meeting at St. Joseph, Mo., on the 10th of January, at the Court House. Next April the Association will have been organized three years, and in that time it has shown great progress and improvement. The members are the best physicians in this section of the country, and large additions are made to the Association each quarter. The meeting was marked with the utmost harmony, and the interest taken was very great.

MORNING SESSION.

The morning session was opened at 10:30 a.m., with the President, Dr. W. I. Heddens, in the chair, and Dr. J. Geiger, Secretary, at the desk. The roll was called and the following gentlemen were found present: Dr. W. H. Bryant, of Savannah; Dr. T. M. Laney, of Savannah; Dr. C. R. Woodson, of Agency; Dr. A. Goslin, of Oregon; Dr. J. S. McAdow, of Guilford; Dr. J. M. Huffman, of Whitesville; Dr. J. H. Rogers, of Amazonia; Dr. C. W. Spicer, of Fillmore; Dr. F. A. Simmons, of Rochester; Dr. W. I. Heddens, Dr. Hugh Trevor, Dr. E. A. Donelan, Dr. C. J. Siemen, Dr. T. H. Doyle, Dr. J. Geiger, Dr. J. P. Chesney, Dr. J. M. Richmond, Dr. S. Carpenter, Dr. G. C. Catlett, Dr. J. T. Berghoff, Dr. D. I. Christopher, Dr. A. P. Busey, and Dr. J. M. France, of St. Joseph; Dr. A. Leigh, of Highland, Kansas.

Drs. Stringfellow and Hill, of St. Joseph, and Dr. Davis, of Hopkins, were present as visitors.

The Corresponding Secretary reported that nothing of importance had passed through his hands.

Drs. Bryant, Chesney and Richmond were appointed by the

chair to arrange a programme for the meeting, to report as soon as possible.

A motion, by Dr. Geiger, for securing certificates of membership and a seal for the society, was carried.

The committee on programme presented the following:

For afternoon session: Essay—Pelvic Cellulitis and Abscess, by Dr. A. Leigh, of Highland, Kan.

Voluntary essays by Dr. Carpenter on Differential Diagnosis between Tuberculosis and Hepatization.

Essay by Dr. J. Geiger on Conjunctivitis.

For evening session—Reports of cases.

Essay by Dr. Chesney on Physiology of the Cervix.

Several reports were received and the society thoroughly organized.

Dr. Carpenter moved that the Secretary notify the members of their arrearages.

Dr. Laney, of Savannah, made a few remarks explaining his absence from former meetings.

Dr. Woodson offered a resolution changing the annual dues from $1.00 to $2.00. Laid over to the next meeting.

AFTERNOON SESSION.

The meeting was called to order by Vice President Dr. Woodson, at 1:30 p.m.

The Secretary being absent, the chair appointed C. W. Spicer Secretary, *pro tem.*

The roll was called. President and Secretary came in and took their places.

Dr. A. Leigh, of Highland, Kansas, read an essay on "Pelvic Cellulitis and Abscess." This essay embraced all the points of importance upon the subject.

On motion, the paper was received.

Dr. Richmond remarked on the essay in a complimentary manner, followed by Dr. Bryant, who gave the differential diagnosis between Cellulitis or Pelvic Peritonitis. He was followed with remarks by Drs. Geiger, Goslin, Carpenter, Siemen and Chesney.

Dr. Carpenter read a voluntary essay on the Differential Diagnosis between Tubercles and Hepatization.

On motion the essay was received.

Dr. Lee made a few remarks upon the subject.

Dr. Bryant read an essay on the differential diagnosis of Bright's disease and treatment. The essay was a very scientific one and ably prepared.

On motion the essay was received.

Dr. Siemen spoke at some length on the essay.

On motion the society adjourned until 7 o'clock p.m.

EVENING SESSION.

The society was called to order at 7 p.m. Dr. Heddens, Presi-

dent, in the chair, and Dr. Geiger, Secretary, present. Dr. Chesney read an essay on the "Physiology of the Cervix," which was well prepared and was received by the society.

Dr. Geiger now read an essay on "Conjunctivitis," which showed careful study and was received.

The subject of the essay was discussed by Drs. Christopher, Richmond, Catlett, Carpenter, Goslin, Bryant, Heddens and Doyle.

Dr. Richmond read a voluntary paper, which was received.

Remarks were made upon the paper by Drs. Goslin, Carpenter an Leigh.

Dr. Bryant, of Savannah, reported a case of reflex irritation of the genital organs, producing disease of the mind.

Dr. Heddens related a few cases in practice, and believed that the removal of the clitoris or prepuce was good practice.

Dr. Doyle moved that the discussion of the question, periostitis, be disposed of, and the remainder of the programme followed out. The motion was carried.

Dr. Siemen reported an interesting case anencephalus, ascribing the cause to be an impression made during pregnancy.

Dr. Heddens spoke at some length on the case.

Dr. Goslin reported a severe case of acute icteræmia.

Dr. Siemen, Doyle and Geiger spoke on the case.

Dr. Leigh narrated a case of typho-malarial fever complicated with pelvic cellulitis. Dr. Bryant gave his views on the case.

The committee reported the following programme of business for the next meeting:

Essayists—Drs. D. I. Christopher, A. Goslin, G. C. Catlett, and B. L. G. Stone.

Subject for discussion, "Alleged Mal-Practice."

Valedictory by the President, Dr. Heddens.

Dr. Bryant offered the following as amendatory to the constitution and by-laws:

That Section 3, requiring members to be a member of a local society, be expunged.

It was laid over until the next meeting.

The President, Dr. Heddens, now made a few remarks, thanking the members for their attendance and attention, and for the great benefit that was derived from the meeting, and hoped that all would be present at the next, which will be the annual meeting, and will be held the second Thursday in April, beginning at 10 a.m.

The meeting then adjourned.

Selections.

A Ludicrous Ending of a Scientific Dispute.

We have several times alluded to the extraordinary dispute engaged in by some of the most learned men in Europe, regarding the "spontaneous generation theory," so long persistently advocated by certain experimenters, and prominently by Dr. Bastian, of England. Professor Tyndall contended that his experiments in 1876, which were conducted with great ingenuity and care, disproved all the positions of Dr. Bastian, and left him to be regarded as an untrustworthy experimenter and observer. This was bold ground for Tyndall to take, as Dr. Bastian held a high position, and his researches were to a large extent regarded as reliable. The contest between Tyndall and Bastian continued with great acrimony for many months, each conducting all the time elaborate experiments and appealing to the results as positive evidence of the correctness of his peculiar views.

Prominent among the opponents of Bastian is M. Pasteur, the distinguished *savant* of the French Academy at Paris, and he joined early in the fray. It would seem, as we have before intimated, a comparatively easy matter to determine by rigid experiment whether under any known conditions the spontaneous generation of living beings can take place; but after all the alleged researches and experiments of the eminent gentlemen, the whole subject was left in doubt. At last, however, the world of science was clamorous that one phase of the controversy should be settled, and that was the point most decidedly insisted upon by Bastian, which may be stated as follows: He asserts that if urine be carefully deprived of every organic germ, be exactly neutralized with liquor potassæ, and exposed to a temperature of 50° C., certain forms of bacteria promptly appear in the liquor. M. Pasteur repeated this experiment, with the exception that he used fused potash instead of solution of potash, and the mixture remained sterile, the inference being that the germs were introduced with the liquor potassæ. He therefore expressed his opinion that it was not accurate for Dr. Bastain to say that he had discovered the physico-chemical condition necessary for the spontaneous generation of bacteria. Dr. Bastian replied that in using solid potash M. Pasteur had departed needlessly from the conditions of the experiment, and that as a strong solution of potash in suitable quantity could be easily heated to 110° C. in a closed glass tube there was no necessity for the substitution. Dr. Bastian looked upon it as incredible that a fluid so caustic as the

strong liquor potassæ he had employed could contain living germs after being heated to 110° C. Further, he asserted, that M. Pasteur had added too much potash and rendered the liquid alkaline.

The next step was on the part of M. Pasteur, and was a "defiance" to Dr. Bastian to produce fermentation in sterile urine, under the stated condition, in the presence of competent judges, provided only that pure potash and pure water, free from organic matter, should be used in the preparation of the solution, or, if otherwise, that the solution should be previously heated to 110° C. for twenty minutes, or to 130° C. for five minutes. This challenge Dr. Bastian at once accepted, with the remark that he had already repeated his experiments under conditions even more severe than those proposed by M. Pasteur, having used liquor potassæ that had been previously heated to 110° C. for sixty hours instead of twenty minutes, and that in twenty-four to forty-eight hours the urine was in full fermentation and swarmed with bacteria.

At the request of M. Pasteur, the French Academy of Sciences, before whom the latter part of the discussion had taken place, appointed a commission, consisting of Messrs. Dumas, Milne-Edwards, and Boussingault, to express an opinion upon the point under dispute between Dr. Bastian and M. Pasteur. This was early in the winter of 1876–77, and Dr. Bastian, learning from *Comtes Rendus* that the commission had been appointed, wrote on the 27th of February last to M. Dumas, offering to go to Paris for three days at a convenient time to perform his experiments before the members. The reply to this letter appears to have miscarried, for on the 5th of May Dr. Bastian received a letter—that had been misdirected—referring to one that had been sent three weeks earlier but not received, reiterating that the commission were ready to receive Dr. Bastian, and that the laboratory of the Ecole Normale, or any other that he chose, would be placed at his disposal. To this Dr. Bastian replied, asking for the purport of the missing letter, and saying that in consequence of the delay that had occurred he would not be able to visit Paris until the third week in July. Upon receiving a duplicate copy of the missing letter, Dr. Bastian considered it not to be sufficiently explicit as to the limits of the inquiry. He therefore wrote back to say that he considered the essential condition of the inquiry to be, "whether previously boiled urine, protected from contamination, can or cannot be made to ferment and swarm with certain organisms by the addition of some quantity of liquor potassæ which has been heated to 110° C. for twenty minutes at least." An extension of the inquiry to the theoretical bearings of the experiment he refused to entertain, on the ground of the brief time at his disposal. No objection was made to these restrictions, but after a month had passed without reply, Dr. Bastian wrote, asking for the assurance he re-

quired, to which M. Dumas answered that the commission would be at his disposal on the 15th of July, and that if possible it would only occupy itself with the subject of urine treated with potash. This did not satisfy Dr. Bastian, and he again wrote, asking for a more explicit statement. M. Dumas replied as follows: "The commission desires, like yourself, that the investigation should be limited to the point in discussion between you and M. Pasteur. It would be only in the case of your desiring to go further that it would have to see whether the time would permit more being undertaken, your visit being short."

After this preliminary epistolary skirmishing, Dr. Bastian went to Paris. Upon his arrival, he found that one member of the commission, M. Boussingault, could not attend, and that another, M. Milne-Edwards, would not, unless the commission were allowed to vary the experiments at discretion. Dr. Bastian then suggested that at present his experiment should simply be repeated, and that he should visit Paris again if any variations were considered necessary. A new member of the commission, M. van Tieghem was then appointed by the Academy.

The last act of this comedy was equal to anything that went before. It having been arranged that the experiments should be performed in M. Pasteur's laboratory, the disputants and M. van Tieghem were there at the appointed time. Next M. Milne-Edwards arrived, but, learning then for the first time of the compromise, he at once left the laboratory, followed by M. van Tieghem. These gentlemen appear to have waited for M. Dumas until they were tired, and then the former went away and the latter returned to the laboratory. When M. Dumas arrived, he learnt that M. Milne-Edwards had left, so he went away also, declaring the commission at an end without communicating with M. van Tieghem, M. Pasteur, or Dr. Bastian. And then Dr. Bastian went home, too.

This is a ludicrous and rather provoking ending of an "affair of honor" between two distinguished scientists, and it is difficult to understand the business. There are "ways that are dark" in so far as the gentlemen of the French Academy are concerned, and Dr. Bastian himself, who seems to have acted in good faith, is in so confused a state as hardly to understand his position.

The result of all this is that the world is to be left for a still longer period in the dark respecting one of the most interesting and important inquiries which come within the domain of science. We have at least fifty competent investigators in this country who can settle this dispute in the course of a single year. It can be accomplished by experiment under rigid test conditions, and let it be done speedily.—*Boston Journal of Chemistry.*

DETERMINATION OF THE SEX BEFORE BIRTH.—Will it be a boy or a girl?—is the question often debated in domestic life, and of great interest to many important personages. The question does not admit of being solved with mathematical certainty, but med-

ical science enables us to obtain a very close approximation. In the first place, experience has established the general fact that the heart beats quicker in the female than in the male infant before birth. This fact is ascertained by means of the stethoscope. The average pulse of the female infant before birth is 150; that of the male infant 120. It is also known that the number of pulsations bears an inverse ratio to the size of the unborn child. It may be objected that the influence on the fœtus of the mother's circulation is not taken into account here. It is assuredly a factor which should not be neglected. The relation is, however, easily established if we divide the fœtal pulse by the maternal pulse. This matter was recently tested at Venice in a case which excited very great interest. Two sisters, very similar in general health and bodily formation, became *enciente* at the same time. The sexes of the children were destined, for certain reasons, to exercise an important influence on valuable interests at stake. In the case of the elder sister the fœtal pulse marked 120; in the younger, 145: and according to previously received ideas the elder sister should have given birth to a boy. But her pulse at the wrist marked 65, while that of the younger sister marked 95. The relations, taking into account the influence of maternal pulse, were, therefore, as 120 divided by 65 to 145 divided by 95, or as 1.84 to 1.47. The inference drawn was that the elder sister would give birth to a girl, the younger to a boy. Their *accouchements* took place on the same day, and the events confirmed the inferences.—*Med. Examiner.*

INSTANTANEOUS CURE OF HYDROCELE.—Dr. Macario, of Nice, contributes to *L'Abeille Médicale* some interesting cases treated by electro-puncture. In the first case, two needles were plunged into the tumor, one at the base and the other at the apex. On connecting the needles the pain was such that the patient refused to continue treatment. Nevertheless, the next day the liquid had disappeared and had not returned at the end of nine years. In the next case absorption was even more rapid, a tumor the size of two fists, dating from fifteen months, having vanished in the evening after a single sitting of one minute. Dr. M. has also reported to the Institute several other cases treated, some by electro-puncture, others by simple induced currents, and it is more than fifteen years since he first recommended this method, which has been followed by several others with considerable success.

A SUPERIOR PASTE.—Mr. Charles A. Durfee, in the *Library Journal*, makes the following remarks regarding a paste which will remain firm through years of handling, and at the same time not stain the page by striking through, as is often the case with gum arabic: After years of experiment, he finds that a paste made of seven parts of gum tragacanth and one part of gum arabic, with a few drops of oil of cloves, or diluted carbolic

acid, will be found most reliable. Bookbinder's paste is excellent, but needs renewing ever few days to avoid souring. The following receipt for starch paste he says is very good: Two ounces of starch, one ounce of white glue, half an ounce of acetic acid, a few drops of oil of cloves. Dissolve the glue in cold water and then boil. Dissolve the starch in cold water, and pour into the glue while boiling.

PACKING PAPER may be made water-tight by dissolving 8.82 lbs. of white soap in 1 quart of water, and dissolving in another quart 1.82 ozs.—troy weight—of gum arabic, and 5.5 ozs. of glue. The two solutions are to be mixed and warmed, the paper soaked in the mixture, passed between rollers and hung up to dry.

[A much simpler and equally efficacious mixture can be made by the addition of a small quantity of bichromate of potash dissolved in water, to the solution of glue alone.]

AMERICAN GUM ARABIC.—The mesquite gum of Western Texas is almost identical with gum arabic. During the past year it has become an article of export, some 12,000 pounds having been gathered in Bexar county, and as much more between that and the coast. This gum exudes from the stem and branches of the mesquite, a mimosa, several species of which grow in Texas, New Mexico, and Arizona.

Clinical Reports from Private Practice.

AMPUTATION OF THE RECTUM. By W. Bedford Craig, M. D., of St. Joseph, Mo.

Having had my attention attracted to an article in the January number of your valuable journal entitled "Ford—Amputation of the Rectum," I desire to report a successful operation, performed recently by me, partaking somewhat of the characteristics of the one described, yet differing in many other particulars.

The patient, Jennie B., aged six years, inmate of "Home of the Friendless"—to which Dr. Knight and myself are physicians—was one of those strumous anæmic subjects, with general muscular relaxation, and local and general atony. As a consequence she suffered from prolapsus recti, which had existed above two years. The tumor measured four inches longitudinally and one

inch and a half to two inches transversely. Nothing could keep it in place while the patient was on her feet. As a result of friction with the clothes and contact with the air ulcers formed, secreting a viscid, glairy fluid, ulcers similar to those seen upon a precedent uterus. Pain prevented her from sitting at all. The dilating power of this plug so stretched some fibres of the the sphincter muscles that the rectum was emptied of its contents involuntarily. She, indeed, was a poor miserable outcast, shunned by both playmates and nurse. We decided to operate at once, her system being first prepared by iron and quinine—the rectum being emptied of its contents. Upon the 25th of October, 1877, assisted by Drs. Knight and Christopher, the patient being under the influence of chloroform, I proceeded to remove V shaped pieces from the lateral surfaces of the mucous membrane of the prolapse, uniting the raw edges with carbolized catgut ligatures. I also removed with the scissors corresponding portions of flabby integument around the margin of the anus in a radial direction, invading slightly the external sphincter. These edges I united with small silk ligatures. The loss of blood was comparatively nothing, as the operation was rapidly done. A pad and T bandage was at once applied and carbolized oil used as a dressing and disinfectant. Liq. opii comp. was administered to control peristaltic action and prevent pain.

The patient made a rapid recovery; in two weeks was up and no return of the prolapse. Constipation ensued, and this together with a fall reproduced the former condition; the prolapse returned in four weeks from the date of the first operation.

Upon deliberation and consultation I decided to perform a more radical operation—that of amputation.

The child being still somewhat anæmic, I allowed a week for a more thorough preparation of the system, for shock and loss of blood. Preparations of iron, syrup, iodide, etc., were used internally and the oleate of quinine rubbed into the axilla and groin.

Upon the 8th of December, I prepared to amputate the prolapsed portion of intestine after a manner comparatively original with me. I was very kindly and efficiently assisted by Drs. Banes, Christopher and Geiger.

The child being thoroughly anæsthetized I passed a needle, armed with stout a carbolized silk ligature, from the margin of the anus, below the prolapsed internal sphincter ani muscles, through the two layers of intestine, bringing it out at the orifice of the bowel, directed by one finger passed up, passing it back again a short distance from its point of entrance through the internal coat or layer, and out to the margin of the anus, the base of the tumor, a little removed from its point of entrance in the external layer. This I did at short intervals completely around the circumference of the gut at its base until

eight ligatures or more had been passed and tied, thus including both coats or layers of intestine, and compressing the arteries completely as I thought. I then removed the congested lower portion—the prolapse, with a rapid stroke of the knife. Considerable hemorrhage ensued, but not to an alarming extent. I therefore, as I intended previously, passed four more ligatures through the stump—still more closely approximating the two walls and immediately arresting all hemorrhage. The same character of ligatures were used as the first number we applied carbolized silk. The stump was a smooth, even, raw surface, well adapted to adhesive inflammation; consequently there was less danger of exhaustion from prolonged suppuration. The patient was immediately placed in bed and the same after treatment followed that was resorted to after the first operation. Her recovery was not quite so rapid as after the minor operation, of course, but improvement was gradual and constant until at the present date, Jan. 19, 1878, she has not the slightest evidence of a return, and is a robust, healthy child.

The points of difference in the operation described in the January number of The Journal, and this is, 1st, My needles were held by a needle forceps, not having needles with handles, and passed them from without, in. 2nd, Instead of allowing the parts to become strangulated and slough, to suppurate and granulate, I removed them at once with the knife, thus leaving a smooth, raw surface for union by first intention, if possible. The hemorrhage was more than necessary. A similar operation I think I could perform with still less loss of blood, although this was not at all alarming or excessive. I am of the opinion that the operation, by removing V shaped pieces, though well recommended, as well as by partial ligation of the mucous membrane, that by the écraseur, is comparatively useless and generally fail to accomplish the desired result, and that in chronic cases, amputation is the only resort for a radical cure, and is perfectly justifiable, all things being equal. This operation was necessarily imperfect, yet it may be of interest and instructive to some, and this is the only apology I offer for reporting it and occupying valuable space in your journal.

SOLUTION OF CHLORATE OF POTASH IN CROUP. By H. H. Suma, M. D., of St. Louis.

Having had the opportunity to treat a case of croup with remarkable good success, I feel inclined to state certain observations which, irrespective of my own benefit, may prove of advantage to my fellow physicians, and herewith tender this to their consideration for further investigation, and should be happy to receive information if any one should have the success I had in treating a case of the same kind. The case treated was a child three and a half years old, which, previous to my attend-

ing, was given up by another physician in the morning. The parents, then in perfect despair, called on me at noon the same day, when I found that the disease had progressed in such a manner that only an operation, probably, could save the child, while it was already laboring under asphyxia, and death being expected very soon. Immediately I called Dr. Hodgen, our honored Professor of Surgery of the St. Louis Medical College, to perform tracheotomy, I assisting. The operation was performed without delay and with skill; the child was then placed under proper care. To counteract the poisonous condition the child was in, I prescribed the following:

℞ Chlorate of Potash.....ʒ ii.
Tincture of Muriate Iron.....℥ ss.
Syrup Simple.....℥ ss.
Aqua Dist.....ʒ i ss.

M. S. A teaspoonful every hour.

Vomiting and coughing being caused by the medicine every time it was administered, I discontinued it; for allaying also the high fever which was always present, injections of quinine were given; quinine seemed to effect the bowels badly, causing timponitis; seeing this effect I disregarded also the use of the enema. The great difficulty now in administering medicine to act against blood poisoning, led me to another change of the treatment, which consisted in dissolving chlorate of potash, one ounce, in about half a gallon of warm water, and placing warm flannel rags, saturated with this solution over the opening of the tracheal tube.

The administering of the chlorate of potash, by inhalation into the lungs, in this way facilitated rapidly the oxidation of the blood; the poisonous condition of the blood seemed to be alleviated; the child improved instantaneously and felt considerably relieved after the first few applications; the expectoration was very loose, respiration normal, restlessness disappeared, fever ceased entirely and the bowels were regulated to a healthy state. This successful treatment I continued constantly, and owing to that the patient improved more and more every day, and am happy to state that the child has now recovered entirely. The atmosphere of the sick room was kept always moist, by keeping wet bed sheets hanging in the room. Being encouraged with such a good success after the patient had been given up, and I also doubted its recovery in the commencement, I would like to call the attention of my fellow physicians to the great effect of this singular treatment, and should any of my colleagues attend a case of this kind and may observe the course I took, I should be very thankful to receive the knowledge of its success, and wish him such a good result as I have obtained.

Book Notices and Reviews.

The Science and Art of Surgery, being a Treatise on Surgical Injuries, Disease and Operations. By John Eric Erichsen, F. R. S., F. R. C. S., Professor of Surgery in the University of London, etc. Carefully revised by the author, from the seventh and enlarged English edition. Illustrated with 862 engravings. In two large and beautiful volumes of nearly 2,000 pages; cloth, $8.50; leather, $10.50. Henry C. Lea, Philadelphia, 1878.

In revising this standard work, it will be seen that the author has spared no pains to make it worthy of a continuance of the marked favor which it has so long enjoyed, by bringing it thoroughly up to the advance in the science and art of surgery. There are about 200 pages added to the text, and about 150 wood cuts added to the illustrations.

It will maintain its position as a text-book of the medical student, and a reference book for the practitioner.

Landmarks, Medical and Surgical. By Luther Holden, F. R. C. S., Vice-president and Member of the Court of Examiners of the Royal College of Surgeons of England; Surgeon to St. Bartholomew's and the Foundling Hospitals. From the second English Edition, pp. 128. H. C. Lea, Philadelphia, 1878.

St. Louis Book and News Company.

This little book is dedicated to the students, past and present, of St. Bartholomew's Hospital. It claims to be a careful revision of the former edition. The object has been to collect into a compact form, the leading "landmaks" which are to guide the practicing surgeon in his daily work. Those pertaining to the air passages of the head and ears are not as distinctly given as they might, while those relating to the chest and abdomen, have been ascertained with as much precision as natural variations permit by needles introduced in various directions.

Annual Medical Directory of Regular Physicians in the State of Illinois. Published at Chicago. F. A. Emmons, M. D., editor and proprietor. Price, 50 cents per copy.

This directory is certainly worth the price asked for it. It is enlarged and much improved, and is carefully gotten up, and is printed on good paper. To physicians who wish to send their reprints to the profession in Illinois, it is indispensable. Besides the names and address of the regular physicians, it contains other matters relating to the laws governing the practice of medicine, and to the management of lunatics, paupers, etc. Then

follows the ordinances governing the Board of Health, of the city of Chicago. It also gives a summary of the directions for examination of the urine. The last item of information is that contained in a table of comparative mortality for the year 1877, of fourteen cities. In this table are given the estimated population of the cities, July 1, 1877; the monthly mortality of each city; and the annual death rate per 1,000, for 1876 and 1877.

Why was St. Louis left out of this list of fourteen cities?

MATERIA MEDICA FOR THE USE OF STUDENTS. By JOHN B. BIDDLE, M. D., Prof. Mat. Med. Jefferson Medical College, etc., etc. Eighth edition, pp. 462. Lindsay & Blackiston, Philadelphia, publishers, 1878.

This is a very useful book, containing a description of the remedies mostly in use by the general practitioner, and in a condensed form. The author has studied brevity in the preparation of his work, contenting himself with giving what is necessary to be known of a remedy. The numerous works on this subject show that the exact want of the physician has not yet been met. There is still the want of a philosophical Materia Medica. C.

A GUIDE TO THERAPEUTICS AND MATERIA MEDICA. By ROBERT FARQUHARSON, M. D., Edin., F. R. C. P., London. Enlarged and adapted to the U. S. Pharmacopia. By FRANK WOODBURY, M. D. 12 mo. pp. 410. Philadelphia, Henry C. Lea, 1877.

A prominent feature of this hand book is the discrimination between the physiological and therapeutical effects of remedies. The author has been eminently successful in his purpose to supply a work for students convenient in size, yet containing what is needful for beginners in this important branch of medical studies. E.

A NEW MEDICAL CATALOGUE. We have received from the St. Louis Book and News Compay their new Medical Catalogue for 1877–78, compiled by W. S. PARKER. It is the most complete one ever published by them, and contains the following matter: List of all the leading medical periodicals; catalogue of over 1800 titles of books now in print and for sale by them; complete classified subject index, a most invaluable one, giving, as it does, the subject heading, also sub-headings; list of all physicians' diaries for 1878; list of anatomical plates; new serial publications; reduced list of medical books, and many other important features.

The Elements of Therapeutics. A clinical guide to the action of medicines. By Dr. C. BINZ, Prof. of Pharmacology in the University of Bonn. Translated from the fifth German edition, and edited, with additions, in conformity with the British and American Pharmacopœias. pp. 322. Wm. Wood & Co., New York, publishers. This work contains much valuable information, especially in regard to those remedies which exert an influence on the nervous system.

Books and Pamphlets Received.

State Regulation of Vice. Regulation Efforts in America. The Geneva Congress. By Aaron M. Powell. Wood & Holbrook, New York, publishers. Dnod. pp. 127. The author is an earnest opponent of the Regulating System. The subject is one of interest and importance, but we have not the time nor the disposition to discuss the question in the pages of the Journal. While many things may be said in favor of the Regulating System, yet, on the whole, the *cons at present predominate*.

Higher Medical Education, the True Interest of the Public and of the Profession. An address introductory to the 112th course of lectures in the Medical department of the University of Pennsylvania. Delivered Oct. 1, 1877. By William Pepper, M. D., Prof. of Clinical Medicine. Published by order of the Board of Trustees, and at the request of the medical class. (Will be reviewed next issue.)

Contributions to the History of Medical Education and Medical Institutions in the United States. 1776–1876. A special report prepared for the United States Bureau of Education. By N. S. Davis, A. M., M. D. (Will be reviewed next issue.)

The Metric System. By Hugh Hamilton, M. D. (Read before the Medical Society of the State of Pennsylvania.) Reprinted from the Society's transactions for 1877. Harrisburg, Pa.

The Instructive Operations of the Human System, and how they may be utilized in the management of certain diseases. A paper read before the Tri-State Medical Society, at Evansville, Ind., Oct. 16, 1877.

Special Irritation in Children as Related to True and False Arthropathies. By V. P. Gibney, M. D. A reprint from the transactions of the American Neurological Association, for 1877. (From the author.)

Address. Some of the Hygienic conditions resulting from present conditions of society. By Wm. H. Byford, M. D. Read before the meeting of the Tri-State Medical Society at Evansville, Ind., Oct. 17, 1877.

Seventh Annual Report of the Board of Directors of the Children's Hospital of the District of Columbia.

Pneumono-Dynamics. By G. M. Garland, M. D. A pamphlet of 148 pages. (From the author.)

METEOROLOGICAL OBSERVATIONS.

By A. Wislizenus, M. D.

The following observations of daily temperature in St. Louis are made with a MAXIMUM and MINIMUM thermometer (of Green, N. Y.). The daily minimum occurs generally in the night, the maximum at p. m. The monthly mean of the daily minima and maxima added and divided by 2, gives quite a reliable mean of the monthly temperature.

THERMOMETER, FAHRENHEIT—DECEMBER, 1877.

Day of Month.	Minimum.	Maximum.	Day of Month.	Minimum.	Maximum.
1	23.0	31.5	18	57.0	60.0
2	**20.0**	40.5	19	52.5	68.0
3	27.5	47.0	20	50.0	67.0
4	37.5	58.0	21	50.5	**68.5**
5	35.0	37.5	22	55.5	62.0
6	27.5	37.0	23	51.0	58.5
7	29.5	49.0	24	56.5	59.5
8	30.5	41.5	25	54.0	57.5
9	27.0	46.5	26	45.0	48.0
10	38.5	56.5	27	43.0	45.5
11	44.5	66.5	28	40.5	47.5
12	46.0	68.0	29	42.0	44.5
13	41.0	56.5	30	37.0	40.0
14	34.0	53.0	31	33.0	41.5
15	43.0	65.0			
16	54.0	62.0	Means	41.4	50.3
17	57.0	66.0	Monthly Mean	45.8	

Quantity of rain, 2.79 inches.

MORTALITY REPORT.---CITY OF ST. LOUIS.

FROM DEC. 30, 1877, TO JAN. 12, 1878, INCLUSIVE.

Small-Pox	1	Inanition, Want of Breast Milk, etc.	10
Measles		Alcoholism	
Syphilis, Cong'al	1	Rheumatism and Gout	
Scarlatina	1	Cancer	2
Pyæmia		Phthisis Pulmon	24
Erysipelas	1	Bronchitis	12
Diphtheria	4	Pleuritis	1
Membranous Croup		Emphysema	6
Whooping Cough	1	Pneumonia	13
Typhus Fever		Heart Diseases	13
Typhoid Fever	3	Aneurism	
Cerebro Spinal Fe.		Marasmus—Tabes Mesenterica and Scrofula	7
Remittent, Intermittent, Typho-Malarial, Congestive and Simple Continued Fevers	4	Hydrocephalus and Tubercular Meningitis	
Puerperal Disea's	2	Meningitis and Encephalitis	2
Diarrhœal "	1	Convulsions	6
		Direct Effect of Solar Heat	
		Apoplexy	2
		All Diseases of the Brain and Nervous System	19
		Cirrhosis of Liver and Hepatitis	5
		Enteritis, Gastro-Enteritis, Peritonitis, and Gastritis	9
		Bright's Disease and Nephritis	
		Cyanosis and Atelectasis	1
		Premature and Preternatural Birth	4
		Surgical Operat'ns	
		Deaths by Suicide	2
		Deaths by Acci'nt	4
		Total Deaths from all Causes	161
		Total Zymotic Diseases	29
		Total Constitutional Diseases	33
		Total Local Diseases	88
		Total Develop'tal Diseases	5
		Deaths by Viol'ce	6

CHAS. W. FRANCIS, *Health Commissioner.*

COMPARATIVE MORTALITY RATES.

	Estimated Population, July 1, 1878.	Total Mortality for two weeks, ending Jan. 12, 1878.	Annual Death Rate per 1000 for the two weeks.
New York	1,093,171	1,666	25.35
Philadelphia	876,118	611	18.18
Brooklyn	549,438	416	19.68
St. Louis	500,000*	161	8.37
Chicago	460,000	257	14.52
Boston	375,176	290	20.16

*Estimated population, May 1, 1877, 501,189.

WYETH'S

DIALYSED IRON.

(Ferrum Dialysatum.)

A Pure Neutral Solution of Oxide of Iron in the Colloid Form. The result of Endosmosis and Diffusion with Distilled Water.

PREPARED SOLELY BY

JOHN WYETH & BRO.

PHILADELPHIA.

This article possesses great advantages over every other ferruginous preparation heretofore introduced, as it is a solution of Iron in as nearly as possible the form in which it exists in the blood. It is a preparation of invariable strength and purity, obtained by a process of dialysation, the iron being separated from its combinations by endosmosis, according to the law of diffusion of liquids. **It has no styptic taste, does not blacken the teeth, disturb the stomach, or constipate the bowels.**

It affords, therefore, the VERY BEST mode of administering

IRON

Cases Where the Use of this Remedy is Indicated.

The advantages claimed for this preparation of Iron are due to the absence of free acid, which is dependent upon the perfect dialysation of the solution. The samples of German, French, and American Liquor Oxidi Dialys., which we have examined, give acid reaction to test paper. If dialysation is continued sufficiently long, it should be tasteless and neutral.

Our Dialysed Iron is not a saline compound, and is easily distinguished from Salts of Iron, by not giving rise to a blood-red precipitate upon the addition of an Alkaline Sulphocyanide, or a blue precipitate with Ferrocyanide of Potassium. It does not become cloudy when boiled. When agitated with one part of Alcohol and two parts of Ether (fortior), the Ether layer is made yellow.

Physicians and Apothecaries will appreciate how important is the fact that, as an antidote for Poisoning by Arsenic, Dialysed Iron is quite as efficient as the Hydrated Sesquioxide (hitherto the best remedy known in such cases) and has the great advantage of being always ready for immediate use. It will now doubtless be found in every drugstore to supply such an emergency.

Full directions accompany each bottle.

In addition to the Solution, we prepare a Syrup which is pleasantly flavored, but as the Solution is tasteless, we recommend it in preference. Physicians will find our **Dialysed Iron** in all the leading drug stores in the United States and Canada.

It is put up in bottles retailing for **One Dollar**, containing sufficient for four weeks treatment. Large size is intended for hospitals and dispensing; retail at $1.50.

Price Lists, etc., etc., sent on application.

JOHN WYETH & BRO.

PARIS 1867. 1868. 1872.

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Boudault's Pepsine

And Wine, Elixir, Syrup, Pills and Lozenges of Pepsine.

Since the introduction of Pepsine by Boudault in 1854, **Boudault's Pepsine has been and is still considered the most reliable,** as is attested by the awards it has received at the Exhibitions of 1867, 1868, 1872, 1873, and *in 1876 at the Centennial Exposition at Philadelphia.* Careful tests will enable any one to satisfy himself that *Boudault's Pepsine has a digestive power at least double* that of the best Pepsines in the market, and that it is really the cheapest.

VIENNA, 1873. PHILA. 1876.

It is sold in 1 oz., 8 oz., and 16 oz. bottles. Beware of so-called French Pepsines bearing fictitious names. Ask for and take only **Boudault's.**

Medal of Merit. Medal of Merit.

E. FOUGERA & CO., New York, Agents.

TAMAR INDIEN

A laxative, refreshing, and medicated Fruit Lozenge, agreeable to take, and never causing irritation. Its physiological action assures the immediate relief and effectual cure of **CONSTIPATION** CEREBRAL CONGESTION, HEADACHE, INDIGESTION, BILE, HEMORRHOIDS, etc., etc., by augmenting the peristaltic movement of the intestines without producing undue secretion of the liquids. Unlike pills and the usual purgatives, it does not predispose to intestinal sluggishness, and the same dose always produces the same effect, that is to say, never needs increasing. These properties render "Tamar" invaluable to the weak and debilitated, and especially to ladies previous and subsequent to their accouchment. It is recommended by the most eminent Physicians of Paris; notably Drs. BERLIN and TARDIEU, who prescribe it constantly for the above complaints, and with most marked success.

Prepared by **E. GRILLON,** Pharmacien de 1ere classe, 27 Rue Bambuteau, Paris. To be had of all respectable Chemists throughout the world.

DUREL'S SYRUP

—OF—

TAR AND IRON.

Prepared by DUREL, Pharmacist, Paris.

The combination is one preparation of the stimulating and balsamic properties of Tar with the tonic properties of a salt of iron is a desideratum which has at last been attained in this preparation. The indications for such a remedy are many, but it has been found especially useful in CHLOROSIS, BRONCHIAL CATARRH, CATARRH OF THE BLADDER, CHRONIC UTERINE DISCHARGES, depending upon an enfeebled or relaxed state of the system.

It is sold by Chemists generally, and by

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LEBAIGUE'S
DIALYSED IRON,
OR
PURE PEROXIDE OF IRON,
IN SOLUTION, WITHOUT THE AID OF ACIDS OR OTHER SOLVENTS.

It is nearly tasteless, does not blacken the teeth, is very readily absorbed, will not constipate, nor cause any disturbance of the digestive apparatus, and is tolerated by persons who could not support any other preparation of iron. It is offered in the form of a **solution,** which is generally preferred; or of an **elixir,** when a slight stimulant is desired.

BLANCARD'S PILLS
OF UNCHANGEABLE IODIDE OF IRON.

Blancard's Pills of Iodide of Iron are so scrupulously prepared, and so well made, that none other have acquired a so well deserved favor among physicians and pharmaceutists. Each pill, containing one grain of proto-iodide of iron, is covered with finely pulverised iron, and covered with balsam of tolu. Dose, two to six pills a day. The genuine have a *reactive silver seal* attached to the lower part of the cork, and a green label on the wrapper, bearing the fac-simile of the signature of

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DOCTOR GIBERT'S
DEPURATORY SYRUP AND DRAGEES,
Of Iodised Deuto-Iodide of Mercury.

These preparations have been approved by the Academy of Medicine of Paris, and have been thoroughly tested in the hospitals of Paris in the treatment of *Syphilitic, Scrofulous* and other affections requiring the use of iodised remedies.

They are recommended for the utmost accuracy of composition, and their perfect preservation.

Prepared by VAUQUELIN-DESLAURIERS, Chemist, Paris.

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"COLDEN'S LIEBIG'S LIQUID EXTRACT OF BEEF AND TONIC INVIGORATOR is a very agreeable article of diet, and particularly useful when tonics are required, being tolerated when other forms of animal food are rejected. In Diphtheria, Typhoid Fever and every depressing disease, its use will be attended with great advantage. We have prescribed it with success and believe it to be a most valuable medicine."

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J. C. YARNALL, M. D., " Wm. JOHNSTON, M. D., "
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"Incipient cases of Consumption have come under my observation that have been cured by its use." ERASMUS WILSON, M. D., F. R. S., London, Eng.

"Health and vigor of youth is conveyed to the debilitated by this remedy."
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President of the Analytical Association, London, Eng.

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"Is one of the most efficient preparations I have ever met with, and I am satisfied it has been the means of saving life when no other medicine could do so."
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☞This important fact must be remembered: There are many Beef Extracts in solid form, but they only act as nutritives, whilst the Liquid Extract combines many other important qualities that make it at the same time a nutritive, tonic, stimulant and alterative.

This remedy is put up in pint bottles, requires no preparation, (like the Solid Extract); and is, moreover, pleasant to take.

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City of New York.

SESSIONS OF 1877-'78.

The Collegiate Year in this Institution embraces a preliminary Autumnal Term, the Regular Winter Session, and a Spring Session.

The Preliminary Autumnal Term for 1877-1878 will open on Wednesday, September 19, 1877, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures on special subjects and daily clinical lectures, will be given, as heretofore, by the entire Faculty. Students expecting to attend the Regular Session are strongly recommended to attend the Preliminary Term, but attendance during the latter is not required. During the Preliminary Term clinical and didactic lectures will be given in precisely the same number and order as in the Regular Session.

The Regular Session will commence on Wednesday, October 3, 1877, and end about the 1st of March, 1878.

FACULTY.

ISAAC E. TAYLOR, M. D.,
Emeritus Professor of Obsterics and Diseases of Women, and President of the Faculty.

JAMES R. WOOD, M. D., LL. D.,
Emeritus Prof. of Surgery.

FORDYCE BARKER, M. D.,
Professor of Clinical Midwifery and Diseases of Women.

AUSTIN FLINT, M. D.,
Professor of the Principles and Practice of Medicine and Clinical Medicine.

W. H. VAN BUREN, M. D.,
Professor of Principles and Practice of Surgery, Diseases of Genito-Urinary System, and Clinical Surgery.

LEWIS A. SAYRE, M. D.,
Professor of Orthopedic Surgery, Fractures and Dislocations, and Clinical Surgery.

ALEXANDER B. MOTT, M. D.,
Professor of Clinical and Operative Surgery.

WM. T. LUSK, M. D.,
Professor of Obstetrics and Diseases of Women and Children, and Clinical Midwifery.

EDMUND R. PEASLEE, M. D. LL. D.
Professor of Gynæcology.

WILLIAM M. POLK, M. D.,
Professor of Materia Medica and Therapeutics, and Clinical Medicine.

AUSTIN FLINT, JR., M. D.,
Professor of Physiology and Physiological Anatomy, and Secretary of the Faculty.

JOSEPH D. BRYANT, M. D.,
Lecturer on General, Descriptive and Surgical Anatomy.

R. OGDEN DOREMUS, M. D., LL. D.
Professor of Chemistry and Toxicology.

EDWARD G. JANEWAY, M. D.,
Professor of Pathological Anatomy and Histology, Diseases of the Nervous System, and Clinical Medicine.

PROFESSORS OF SPECIAL DEPARTMENTS, Etc.

HENRY D. NOYES, M. D.,
Professor of Ophthalmology and Otology.

JOHN P. GRAY, M. D., LL. D.,
Professor of Psychological Medicine and Medical Jurisprudence.

EDWARD L. KEYES, M. D.,
Professor of Dermatology, and adjunct to the Chair of Principles of Surgery.

EDWARD G. JANEWAY, M. D.,
Professor of Practical Anatomy, (Demonstrator of Anatomy.)

LEROY MILTON YALE, M. D.,
Lecturer Adjunct upon Orthopedic Surgery.

A. A. SMITH, M. D.,
Lecturer Adjunct upon Clinical Medicine.

A distinctive feature of the method of instruction in this College is the union of clinical and didactic teaching. All the lectures are given within the Hospital grounds. During the Regular Winter Session, in addition to four didactic lectures on every week day except Saturday, two or three hours are daily alloted to clinical instruction.

The Spring Session consists chiefly of Recitations from Text-books. This term continues from the first of March to the first of June. During this session, daily recitations in all the departments are held by a corps of examiners appointed by the regular Faculty. Regular clinics are also given in the Hospital and College building.

FEES FOR THE REGULAR SESSION.

Fees for Tickets to all the Lectures during the Preliminary and Regular term, including Clinical Lectures,	$140.00
Matriculation Fee,	5.00
Demonstrator's Ticket, (including material for dissection,)	10.00
Graduation Fee,	0.00

FEES FOR THE SPRING SESSION.

Matriculation, (Ticket good for the following Winter),	$ 5.00
Recitations, Clinics and Lectures,	35.00
Dissection, (Ticket good for the following Winter,)	10.00

☞Students who have attended two full Winter Courses of lectures may be examined at the end of the second course upon Materia Medica, Physiology, Anatomy and Chemistry, and if successful, they will be examined at the end of their third course upon Practice of Medicine, Surgery and Obstetrics only.

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. AUSTIN FLINT Jr., Secretary, Bellevue Hospital Medical College.

DR. GARRATT'S CONSTANT ELECTRIC DISKS.

That any person may apply and wear with comfort for relief of local *Pains* and *Weakness*, for old Rheumatic and Neuralgic pains, Coldness and Stiffness. It is also remarkable for its constant power to help Weak Lungs, Heart, Stomach, Kidneys, Sluggish Liver, Lame Back and other ills.

While worn, by night or day, this flexible pad, is self-charging and applies a fine kind of constant galvanism that wonderfully cures very obstinate nervous ailments. "For the price and purpose there is nothing so scientific and good. It has no equal." So say physicians, druggists, and those who are using this improved electric. Large Disk, $2.50; Long Disks, with straps for the body, $3.50; Do. for large body, $5.00. Can be sent by mail on receipt of price by GARRATT & CO., 6 Hamilton Place, Boston, Massachusetts.

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Trusses, Supporters, Shoulder Braces,

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DRY PEPSIN, concentrated, of which one grain digests from 125 to 150 grains of coagulated albumen, particularly recommended to manufacturers. Premiums were awarded to the above preparations at the

International Exposition at Vienna, in 1873, and the Centennial Exposition in Philadelphia.

R. A. ROBINSON & CO., Wholesale Agents,

Louisville, Kentucky.

Starling Medical College,

COLUMBUS, OHIO.

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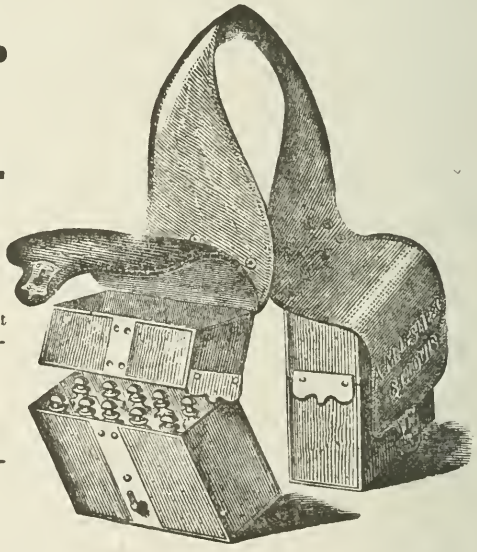

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